

Boston Transit Commission.

Fifteenth Annual Report.



June 30, 1909

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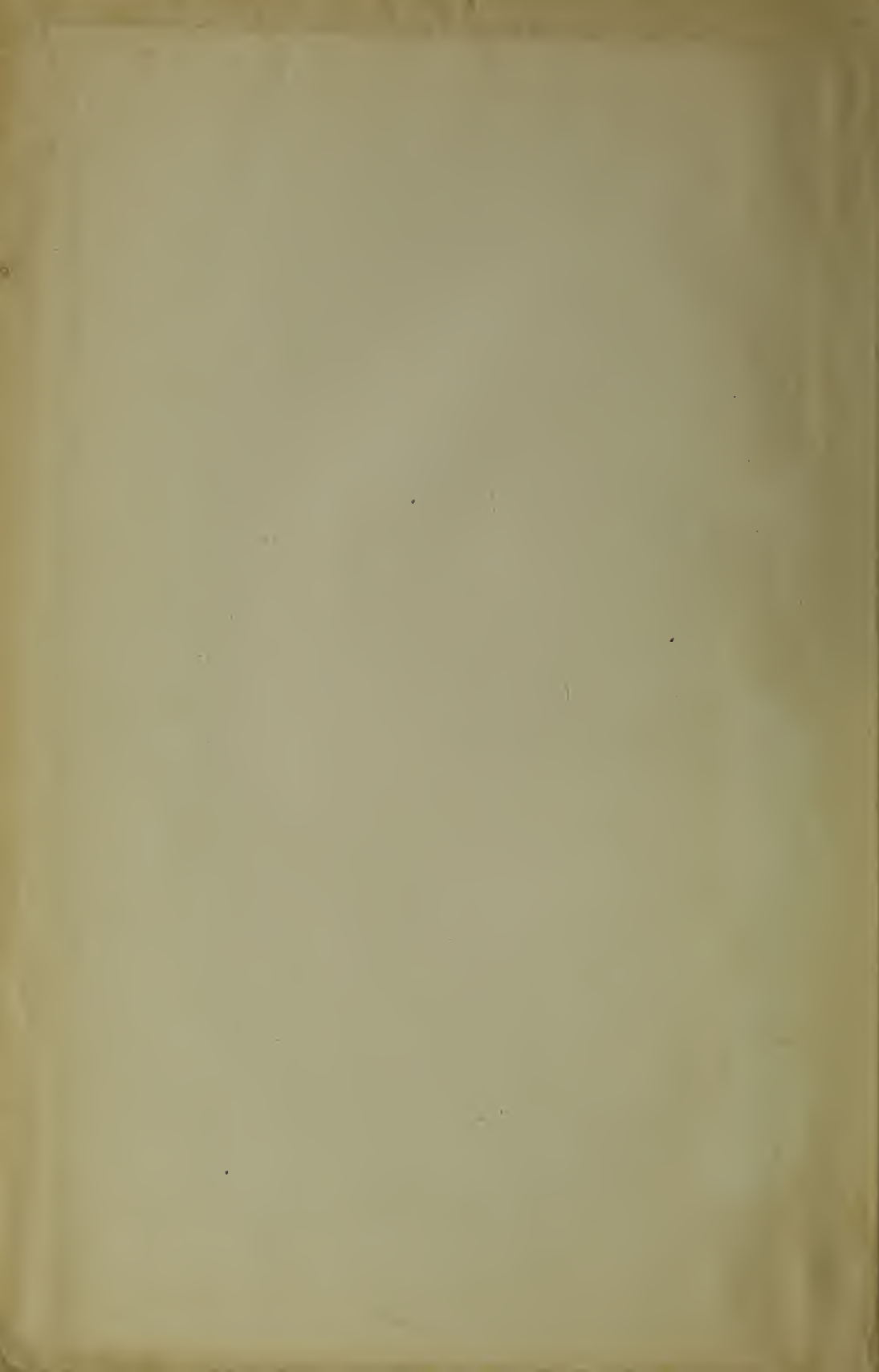
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FROM

THE BOSTON TRANSIT COMMISSION,
15 Beacon Street.

GEORGE G. CROCKER, *Chairman,*

GEORGE F. SWAIN,

JOSIAH QUINCY,

HORACE G. ALLEN,

JAMES B. NOVES,

Commissioners.

HOWARD A. CARSON,

B. LEIGHTON BEAL,

Chief Engineer.

Secretary.

FIFTEENTH ANNUAL REPORT

OF THE

BOSTON TRANSIT COMMISSION,

FOR THE YEAR ENDING

JUNE 30, 1909.



BOSTON

E. W. DOYLE, PRINTER

185 Franklin Street

1909

BOSTON TRANSIT COMMISSION.

15 BEACON STREET, BOSTON, June 30, 1909.

TO THE CITY COUNCIL OF THE CITY OF BOSTON:

In compliance with Statutes of 1894, chapter 548, section 24, the report of the Boston Transit Commission for the year ending June 30, 1909, is respectfully submitted.

WASHINGTON STREET TUNNEL.

On November 23, 1908, under the joint auspices of the Commission and the Boston Elevated Railway Company, a trip of inspection through the Washington Street Tunnel was made by about one thousand persons prominent in public and private life, including representatives of the state and city governments and of business associations, and on Monday, November 30, the tunnel was opened for public use.

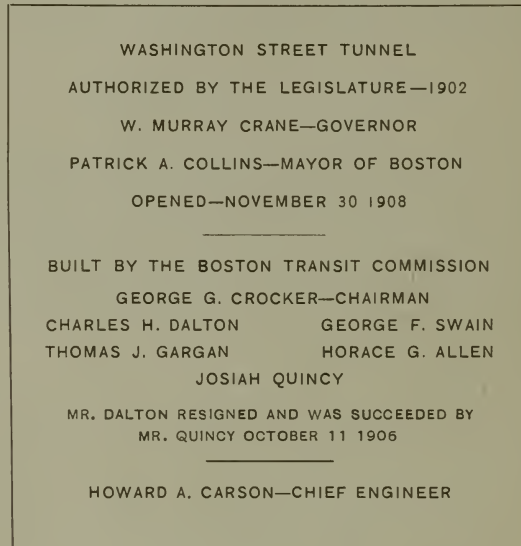
Almost immediately thereafter the work was begun of enlarging the Haymarket square station of the subway to restore to it the two tracks for surface cars, which since 1902 had been used for elevated train service, to relocate the tracks and platforms, and to connect it by an underground passageway with the Union-Friend station of the tunnel, thus furnishing a means of transfer between these two stations. The undertaking was of a peculiarly intricate nature, because it was necessary to carry it on without interrupting the traffic in either the subway or the tunnel. It was successfully completed in May, 1909, and marked the completion of the tunnel, with the exception of some minor matters in connection with the Relief Station of the City Hospital in Haymarket square.

As the operation of the tunnel involved the discontinuance of the train service in the subway, and several other changes from the methods of procedure to which the traveling public had become accustomed, there was more or less confusion in the days immediately following its opening, and

many complaints and suggestions were received by the Commission. These seemed to be founded upon the mistaken idea that it was within the jurisdiction of the Commission to control the operating methods of the company.

Bronze Tablet.

Following the custom established by the Commission of placing in each of the structures erected by it a bronze tablet giving the essential facts in relation to construction, such a tablet was erected in the State station in March, 1909. The inscription is as follows:



SETTLEMENTS FOR TAKINGS.

Settlements for real estate or rights or interests therein taken by the Commission have been made as follows:

Jan. 19, 1909, Vaughan-Abbot Estate, 235-7-9 Washington street, easement.

Jan. 25, 1909, Philip Dexter et al., 766 Washington street, easement.

April 1, 1909, Charles W. Galloupe Estate, 736-40 Washington street, easement.

The terms of the agreement for the settlement for the taking from the Blake estate on Temple place have been carried out up to date.

RESIGNATION OF HOWARD ADAMS CARSON.

Upon the creation of the Commission in 1894, Howard Adams Carson was appointed its Chief Engineer.

In March, 1909, while absent on one of his brief and infrequent periods of rest, Mr. Carson forwarded to the Commission his resignation, to take effect at its pleasure. Efforts to induce him to reconsider this action were of no avail, and at the date of this report he severed a connection with the Commission of nearly fifteen years duration. In accepting his resignation the Commission caused the following to be entered upon its records:

"In accepting the resignation of Howard Adams Carson after a service of fifteen years as its Chief Engineer, the Boston Transit Commission places upon its records this expression of the great regret which it feels at his retirement from this position and of its high appreciation of the value of the work which he has performed for the public.

"The Tremont street subway, the first for electric street car service constructed in this country, the East Boston tunnel, the first sub-marine tunnel built in this country for such service, and the Washington street tunnel, stand as monuments to his engineering skill and judgment in the solving of difficult problems. The building of these great works, through narrow and crooked streets bordered by high buildings, through filled-in ground, or below the water level, has been a difficult achievement crowned with entire success. The record which he has made in the planning and execution of these novel and hazardous undertakings has placed him in the front rank of civil engineers.

"Other qualities than those of technical skill have been shown by him in an equally notable degree. His tact in dealing with public and private interests, which in the progress of these works were of necessity seriously affected, his painstaking fairness in his relations with contractors, his skill in organizing and directing the engineering staff, his executive force, and his unflinching willingness to bear every proper responsibility of his office, have all been conspicuous. Scrupulous honesty and impartiality, moderation and modesty in all things, faithfulness to the point of extreme self-sacrifice have been characteristic of his service. At the termination of that service this Commission records its admiration of his professional skill and its high regard for his personal character."

The Commission still further expressed its appreciation of his service in the following letter:

BOSTON, June 10, 1909.

HOWARD ADAMS CARSON, ESQ., *Chief Engineer, Boston Transit Commission.*

DEAR MR. CARSON:—We have today, with great regret, accepted your resignation to take effect on June 30th. The Tremont street subway, the East Boston tunnel and the Washington street tunnel are enduring monuments of your service as Chief Engineer of this Commission

and place you in the front rank of your profession. Highly as these structures have been commended, you have received but a small part of the credit which you deserve, for none except those who have followed your work in detail can appreciate the novel and hazardous conditions which have been encountered. Varied and difficult as the problems have been, you have never been found unequal to the task before you.

The notable success of your work has been due not merely to your engineering skill but also in large measure to your scrupulously fair and judicial consideration of the rights and interests of others. The well deserved confidence which you have inspired, alike in property owners, contractors, employees and the public, has kept your work free from many obstacles which otherwise would have resulted in serious delays and largely increased expense.

During the fifteen years of your service with this Commission you have proved yourself the ideal of all that an engineer should be in the planning and execution of great public works; we certify to this as officials, without limitation or reservation of any kind. Let us add that between yourself and the members of the Commission a highly valued friendship has developed and has grown with each year of association.

Wishing you for the future continued professional success and all personal happiness, we subscribe ourselves

Very sincerely yours,

GEORGE G. CROCKER,
GEORGE F. SWAIN,
HORACE G. ALLEN,
JOSIAH QUINCY.

Edmund S. Davis, who has been the principal assistant of Mr. Carson since the beginning of the work, has been appointed Acting Chief Engineer, his appointment to take effect July 1.

DECEASE OF HON. THOMAS JOHN GARGAN.

July 31, 1908, Hon. Thomas John Gargan died in Berlin, Germany, from the results of a surgical operation. Mr. Gargan was a member of the original Subway Commission appointed under the act of 1893, and had continued as a member of this Commission since its organization in 1894. To the end of his life his deep interest in the work of the Commission was evidenced in many ways, although during the last year of his service failing health rendered his regular attendance at meetings impossible.

At a special meeting of the Commission held on the day of Mr. Gargan's death the following entry was ordered to be made upon the records:

"By the death this day of Thomas J. Gargan, a member of this Commission, in the city of Berlin, Germany, the state and city have lost a valuable public servant and his associates on this board a wise counselor and loyal friend.

"Appointed by the Mayor of Boston in 1894 as one of the three members of the original Subway Commission, and continued in office

as a member of the Boston Transit Commission when this body was constituted by legislative act later in the same year, he has served the public for nearly 15 years in the work of planning and constructing our system of subways. Death deprives him by a few months of the realization of his cherished wish to see the Washington street tunnel, in which he always took a deep interest, opened for use during his term of service.

"We bear testimony to the intelligence and discretion which he has shown in solving the many new and complicated problems which have arisen in our work, and to the loss which the public has suffered in being deprived of the benefit of his good advice, founded on large experience and a determination to promote and safeguard the interests of the city.

"We shall feel his loss not only as a valued colleague but also on account of the warm friendship which has long existed between him and the other members of our board, constantly expressed on his part by kindly word and act. We shall miss his genial presence, his pleasant voice, his delicate wit, and his terse expression of the wisdom of a well-read and thoughtful man."

Mr. Gargan was one of the three members of the Commission whose appointment rests with the Mayor of the city of Boston. Up to the date of this report no successor has been named.

TERM OF THE COMMISSION.

By chapter 455 of the acts of the Legislature of the year 1909 the term of the Commission and of its members, which otherwise would have expired at the date of this report, was extended for two years. (See Appendix A).

LEGISLATION.

April 6, 1909, the Legislature passed the following order:

"ORDERED, That the Board of Railroad Commissioners and the Boston Transit Commission, sitting jointly, be requested to investigate and report to the General Court, on or before the last day of April, whether or not it is advisable, in their opinion, to grant the petition for legislation to authorize the Boston and Eastern Electric Railroad Company to construct a tunnel under Boston harbor, and to connect the same with terminals and with the tracks of other companies, substantially in the manner set forth in the bill attached hereto, and under what restrictions, if any, such authority should be granted."

As a result of this order, the joint board made a report to the Legislature which will be found in Appendix B.

There were presented to the Legislature of the present year the following petitions for additional transit legislation:

For the construction of a tunnel between Sullivan square and the North station.

For the construction of a subway to Dorchester.

For the construction of subways and tunnels to and in the South Boston district.

For the construction of a subway or tunnel between the cities of Chelsea and Boston.

For restoring the elevated train service to the Tremont street subway.

For the construction of a cross town tunnel.

For a connection of passenger and freight terminals and stations in the city of Boston.

For the extension of the Washington street tunnel.

For the use of the Tremont street subway by trains.

For connections between the subway, the tunnel and the Atlantic avenue loop of the Boston Elevated Railway Company.

For the establishment of a station at Castle street on the Washington street tunnel route of the Boston Elevated Railway Company.

For the construction of a subway to South Boston.

By Chapter 94 of the Resolves of this year (see Appendix C) these petitions were referred to the Board of Railroad Commissioners and this Commission, sitting jointly, to investigate and report to the next General Court on the expediency of granting any or all of them, and under what conditions and restrictions, if any.

Subsequently, by Chapter 110 of the Resolves of this year (see Appendix D) the petition of the Boston and Eastern Electric Railroad Co., above noted, was similarly referred.

By Chapter 85 of the Resolves of this year (see Appendix E) the same joint board was instructed to consider whether or not it is advisable, expedient, and in the public interest to provide for a distribution of any of the assets of the West End Street Railway Company among its stockholders, or to change the terms and conditions of the first and second preferred stock to be issued by the Boston Elevated Railway Company, (suggested amendments to chapter 551, acts of 1908;) to authorize the Boston Elevated Railway Company to acquire and hold the stock and securities of other street railway companies, etc., and if so, under what conditions and limitations; and to authorize the Boston Elevated Railway Company to extend its elevated railway from Sullivan square to the city of Medford, and if so, under what conditions and limitations.

The report of the Commission on Metropolitan Improvements, so-called, made to the Legislature of 1909, was by Chapter 113 of the Resolves of this year (see Appendix F) referred to a joint board consisting of the members of the Board of Railroad Commissioners, of the Board of Harbor and Land Commissioners, of the Metropolitan Park Commission and of this Commission, with instructions to make a final report to the General Court on or before Jan. 1, 1911, a preliminary report being required on or before January 1, 1910, as to whether or not any immediate action is necessary or desirable. Upon this joint board is also conferred the powers and duties specified in the resolve of 1907 constituting the Commission on Metropolitan Improvements.

SUBWAY.

The Boston Elevated Railway Co. has asked and received permission to construct an additional sub-passage-way between the north and south bound platforms at the Boylston street station, so as to provide that a passenger going into the station from the south on a Tremont street or Shawmut avenue car can only exchange into a car bound west on Boylston street, and that a passenger going into the station from east-bound Boylston street cars can only exchange into a car bound south on Tremont street or Shawmut avenue; or in other words the object is to prevent the possibility of making round trips for a single fare.

It was the intent of the Commission, when the elevated train service was withdrawn from the subway, to make a physical connection at Scollay square between the tracks of the subway and those of the East Boston tunnel. This work was begun in 1904, but was soon discontinued, because such a connection could not have been used so long as a train service existed in the subway. Further delay in this matter will be explained by the following communication from the Boston Elevated Railway Company.

BOSTON ELEVATED RAILWAY CO.
PRESIDENT'S OFFICE.
101 MILK ST.

BOSTON, MASS., May 28, 1909.

*Boston Transit Commission, HON. GEORGE G. CROCKER, Chairman,
15 Beacon St., Boston, Mass.*

DEAR SIR:—Having reference to your communication of May 11th, current, and to so much of it as relates to a connection of the tracks of the East Boston Tunnel with those of the Tremont Street Subway at

grade, we think, upon consideration, that, because of the various matters which by a provision of the Legislature, are to be considered by your Honorable Board jointly with the Railroad Commissioners, no further action ought at present to be taken concerning these tracks.

Respectfully,

BOSTON ELEVATED RAILWAY COMPANY,
By (Signed) WM. A. BANCROFT
President.

Payment of Rental under the Toll System.

In accordance with that clause of the lease of the subway which provides that if in any one quarter the amount which the Company would pay for rental, reckoned on a stated toll for each car, should exceed the amount reckoned on the basis of four and seven-eighths per cent. of the cost, the Company shall pay such excess, the following was received:

BOSTON ELEVATED RAILWAY CO.
TREASURER'S OFFICE,
101 MILK ST.

BOSTON, MASS., October 17, 1908.

MR. B. LEIGHTON BEAL, *Secretary, Boston Transit Commission, 20 Beacon St., Boston, Mass.*

DEAR SIR:—I wish to report that this company has drawn a voucher in favor of the City of Boston for \$11,578.17 being additional rent due for use of Tremont St. subway for the year ending September 30, 1908.

Of this sum \$3,426.59 was for the quarter ending with Dec. 31, 1907, \$879.44 for quarter ending March 31, 1908, \$3,709.47 for quarter ending June 30th, 1908 and \$3,562.67 for the quarter ending Sept. 30th, 1908, this sum being due as provided for in the contract dated Dec. 7th, 1896, for use of the subway, and based on five cents per trip in place of four and seven-eighths per cent. on the cost.

Very truly yours,

(Signed) H. L. WILSON,
Treasurer.

The payments previously made amounted to \$33,125.50, making a total of \$44,703.67 thus far paid on account of the operation of the toll clause.

RIVERBANK SUBWAY.

Chapter 573 of the acts of 1907 makes provision for the construction of an east and west tunnel in the city of Boston, designated in the act as the Riverbank Subway. The construction of this subway, in the words of the act, is to be begun "at such time after the expiration of one year from the completion of the tunnel authorized by said chapter five hundred and thirty-four (of the acts of 1902, Washington street tunnel) as the commission and the company may agree

upon, or in case of difference as the board (of Railroad Commissioners) shall determine that the public interests require; but the same may be begun at any time which the commission and the company may agree upon."

The following correspondence is self-explanatory:

BOSTON TRANSIT COMMISSION,
15 BEACON STREET,

BOSTON, August 27, 1908.

Boston Elevated Railway Co., WILLIAM A. BANCROFT, President.

DEAR SIR:—Under date of Feb. 24, 1908, this Commission received a communication stating that the Boston Elevated Railway Company was unable to agree with this Commission as to the advisability of the immediate construction of the Riverbank subway. Under date of August 17 the Commission received your letter stating that you expect to have the Cambridge Main street subway finished within three years and hoped that the Beacon Hill tunnel will be finished within the same period.

Legislation in relation to these subways contemplates that they shall both be brought to a terminal at or near the present Park street station. It appears that the terminals for these two subways should be planned together and that their construction and the construction of the tracks approaching them, so far as they may adjoin, should in the interest of economy be carried on at the same time.

Will you please consider this matter and at your early convenience make known your views in relation to it.

Yours truly,
(Signed) GEORGE G. CROCKER
Chairman.

BOSTON ELEVATED RAILWAY CO.
PRESIDENT'S OFFICE.
101 MILK ST.

BOSTON, MASS., Sept. 16, 1908.

Boston Transit Commission, GEORGE G. CROCKER, Chairman, 15 Beacon St., Boston, Mass.

DEAR SIR:—In further response to yours of August 27th, ult., in re Beacon Hill tunnel, I am authorized to say that we do not think it clear that the two tunnels contemplated by the Act of 1907 are necessarily to use the same terminal, if indeed, that is what you have in mind in your letter. Neither is it clear that these two subways should necessarily be planned together, either in the interest of economy in construction, or efficiency in operation. Existing conditions may be altered before the time for the construction of the Riverbank Subway, and the portion thereof under Beacon Hill, is reached.

We shall, of course, be glad to discuss the matter with you.

Respectfully,
BOSTON ELEVATED RAILWAY COMPANY,
By (Signed) WM. A. BANCROFT
President.

CAMBRIDGE CONNECTION.

At the date of this report, work on the Cambridge Connection (the Boston end of the Cambridge Main street subway) is suspended, awaiting the decision of the Supreme Court on an application for an injunction.

January 14, 1909, the opinion of the Boston Elevated Railway Company was asked as to the desirability of constructing the tunnel under Beacon Hill with a single tube or with double tubes, and the reply of this company was received February 9 favoring one double track tube, and not two single track tubes.

In accordance with this opinion, specifications were prepared for the construction of Section 1 of the connection, extending from a point in the vicinity of Phillips and Grove streets to a point under the Common about 320 feet west of the Park street station of the subway. Bids based upon these specifications were opened March 30, and on April 6 the bid of Patrick McGovern, being the lowest, was accepted.

Prior to this a petition had been presented to the Legislature, asking that the Commission be required to change the Boston terminus of the connection from Park street to Scollay square. The petitioners were given leave to withdraw, and this report was accepted by the Legislature, the last action thereon being on April 27.

The Commission received letters, March 8 from Herbert Parker, and March 23 from Codman & Street, asking for a delay in the work, in the one case until a legislative decision had been reached upon the pending petition, and in the other until a further hearing could be given to property owners in the vicinity of Scollay square. These letters follow:

March 6, 1909.

HON. GEORGE G. CROCKER, *Chairman Boston Transit Commission*, 15
Beacon Street, Boston, Mass.

MY DEAR SIR:—Mr. Anson M. Lyman and myself are acting as counsel for various persons and associations actively interested in securing legislation, or other official action, that shall fix the terminal of the Cambridge Subway at Scollay Square rather than at Park Street, as is, we are now informed, contemplated by the consideration of the Transit Commission.

A bill has been introduced, and is now under consideration by the Committee on Metropolitan Affairs. Of course, I cannot say, and have no right to anticipate what conclusion the Committee or the Legislature may arrive at, but, pending this inquiry, and while the question is under consideration by the Committee and the General Court, Mr. Lyman and myself, acting in behalf of our clients, and in accordance with what we believe to be a very general public sentiment, feel that we may, without impropriety, respectfully urge upon the Transit Commission that it should suspend the making of any contracts, or the consummation of any plan fixing Park Street as the terminal of the Cambridge Subway, and that the Commission should withhold any further action until the Legislature shall have passed upon the pending important questions.

We believe that the situation is somewhat analogous to that of litigation in the Courts, where property that is the subject of such litigation should be kept *in statu quo* until the determination of the cause.

I am sure that you will know that I make these suggestions with the greatest respect for you, and for your Board, and I believe that you will consider the suggestions justifiable, and I venture to hope that they may commend themselves to your consideration. I am,

Very respectfully yours,
(Signed) HERBERT PARKER

BOSTON, March 22nd, 1909.

Boston Transit Commission, 20 Beacon St., Boston.

GENTLEMEN:—The property owners along Cambridge and Court Sts. and the adjacent district thereto feel very strongly that a great error is being made by not making a subway under Cambridge St. through Bowdoin Sq. to Scollay Sq., instead of by a tunnel under Beacon Hill.

In our opinion a tunnel under the Hill will diminish the values north of the Hill and only another subway through that district can bring them back again. We feel it an injustice to this district and a great mistake to concentrate travel at Park St.

We have been requested by a number of property owners to find out from you if it is too late to stop the work on the tunnel, and to give them a hearing at an early date if the work has not gone too far.

Thanking you in anticipation of your reply, we remain

Yours very truly,
(Signed) CODMAN & STREET

The following replies were made by the Commission:

BOSTON TRANSIT COMMISSION,
15 BEACON STREET,

BOSTON, March 9th, 1909.

HON. HERBERT PARKER, 910 *Barristers Hall*.

DEAR SIR:—Your letter of March 6th relating to a change in the Boston terminal of the Cambridge Main street subway was laid before the Commission at its meeting this morning, and I am instructed to reply that the Commission has never considered it proper for it to discontinue work authorized by the Legislature simply because the question of making alterations in the law has been submitted to the Legislature for its consideration. If, when such questions are raised, the Commission should discontinue work awaiting the decision of the Legislature thereon, the result would be serious and expensive delays. The only proper course for the Commission to take seems to be to carry on the authorized work with all reasonable expedition until such time, if any, as the Legislature may otherwise order.

Bids for the construction of a large part of the said subway connection were advertised for last week, and are to be opened on March 30, and shortly after that time, unless otherwise ordered by the Legislature, a contract for construction will be awarded.

I trust that you will appreciate that the Commission would not be justified in adopting any other course.

Yours very truly,
(Signed) GEORGE G. CROCKER
Chairman.

BOSTON TRANSIT COMMISSION,
15 BEACON STREET,

BOSTON, March 23, 1909.

MESSRS. CODMAN & STREET, 15 *State street*.

GENTLEMEN:—In reply to your communication of the 22nd inst. I am instructed by the Commission to say that an advertised public hearing on the location of the Cambridge Connection was held on De-

cember 18th, 1906, and on February 14, 1907, the Commission fixed the terminus at Park street.

Since that time the Commission has been at work preparing plans, making borings, etc., and recently commenced the work of excavation.

By direction of the Commission I send you a copy of a letter to Hon. Herbert Parker, who made an inquiry somewhat similar to yours.

Yours truly,

(Signed)

B. LEIGHTON BEAL

Secretary.

The Commission was further influenced in its action by the belief that, having once determined that the terminus should be at Park street, and the Boston Elevated Railway Company having accepted such decision by failing to exercise its right to appeal to the Railroad Commissioners within three days from the date thereof, the power of the Commission in the premises was exhausted.

April 8, 1909, subsequent to the award of the contract for Section 1 to Patrick McGovern, but prior to the execution and delivery of such contract, a bill in equity was filed in the Supreme Court asking the Court to enjoin the Commission from making the terminus at Park street. Various grounds were assigned, some of which involved the constitutionality of the act. The matter was heard before a single Justice of the Supreme Court and by him reported to the Full Bench, which, at the date of this report, still has it under consideration.

The Commission expressed the opinion in its last annual report that a simple enlargement by one-third of the existing stairway coverings on the Common would not properly accommodate the traffic that would be brought to the vicinity of Park street, and that it would be necessary to make further openings in the Common for entrances and exits. It was felt that such openings, if made, would need protection of some sort, and accordingly, in January, the Corporation Counsel was consulted as to whether the provision in the act prohibiting the erection of "structures" on the Common would be violated by placing fences around such entrances and exits, to which inquiry he gave an oral opinion in the negative.

EAST BOSTON TUNNEL.

Toll Receipts.

The following is a statement of the receipts from tolls and the cost of collection of the same for the year ending June 30, 1909:

July 1, 1908, to July 31, 1908:		
Receipts	\$9,505.39	
Cost	1,481.88	
Net		\$8,023.51
Aug. 1, 1908, to Oct. 31, 1908:		
Receipts	\$30,380.66	
Cost	4,488.34	
Net		25,892.32
Nov. 1, 1908, to Jan. 31, 1909:		
Receipts	\$32,247.75	
Cost	4,460.45	
Net		27,787.30
Feb. 1, 1909, to Apr. 30, 1909:		
Receipts	\$31,094.00	
Cost	4,418.72	
Net		26,675.28
May 1, 1909, to June 30, 1909:		
Receipts	\$22,261.61	
Cost	2,976.17	
Net		19,285.44
Total		<u>\$107,663.85</u>

Cost includes wages, cost of exit tickets, cost of entrance tickets, power for lighting and heating, cost of necessary accounting, proportion of indemnity insurance premiums on bonds of collectors, toll collectors and ticket sellers.

The Boston Elevated Railway Company paid in rentals in 1908, \$51,685.09, being according to the statute three-eighths of one per cent. of its gross receipts for one year.

SINKING FUNDS.

The following is the condition of the debt and of the sinking funds for the various divisions of the work of the Commission at the date of this report, as stated by the City Treasurer:

SUBWAY (INCLUDING ALTERATIONS.)

(Debt, \$4,416,000, outside debt limit.)

Amount of fund, July 1, 1908	\$1,039,772.95
Interest on bank deposits, July 1, 1908, to date	\$3,490.39
Interest on investments, July 1, 1908, to date	33,420.00
Revenue, etc., July 1, 1908, to date	63,664.62
	<u>100,575.01</u>
	<u>\$1,140,347.96</u>

BOSTON TRANSIT COMMISSION.

CHARLESTOWN BRIDGE, No. 1.

(Debt, \$750,000, inside debt limit.)

Amount of fund, July 1, 1908		\$147,537.23
Interest on bank deposits, July 1, 1908, to date	\$298.35	
Interest on investments, July 1, 1908, to date	5,155.00	
Requirement for debt	8,107.00	
		<hr/> 13,560.35
		<hr/> \$161,097.58

CHARLESTOWN BRIDGE, No. 2.

(Debt, \$805,000, outside debt limit.)

Amount of fund, July 1, 1908		\$180,649.21
Interest on bank deposits, July 1, 1908, to date	\$526.67	
Interest on investments, July 1, 1908, to date	5,611.00	
Revenue, etc., July 1, 1908, to date	1,433.36	
Requirement for debt	6,204.00	
		<hr/> 13,775.03
		<hr/> \$194,424.24

EAST BOSTON TUNNEL.

(Debt, \$3,193,000, outside debt limit.)

Amount of fund, July 1, 1908		\$182,961.98
Interest on bank deposits, July 1, 1908, to date	\$1,950.75	
Interest on investments, July 1, 1908, to date	4,375.00	
Revenue, etc., July 1, 1908, to date	52,272.23	
		<hr/> 58,597.98
		<hr/> \$241,559.96

BOSTON TUNNEL AND SUBWAY.

*(Washington Street Tunnel)**(Debt, \$8,256,700, outside debt limit.)*

Amount of fund, July 1, 1908		\$232,133.18
Interest on bank deposits, July 1, 1908, to date	\$2,899.28	
Interest on investments, July 1, 1908, to date	4,314.50	
Revenue, etc., July 1, 1908 to date	50,977.64	
Premium, sale of bonds	9,099.00	
		<hr/> 67,290.42
		<hr/> \$299,423.60

RIVERBANK SUBWAY.

(Debt, \$5,000, outside debt limit.)

No fund.

RAPID TRANSIT—CAMBRIDGE CONNECTION.

(Debt, \$350,000, outside debt limit.)

Amount of fund, April 30, 1909		\$10,615.50
Interest on bank deposits, April 30, 1909, to date		33.49
		<hr/> \$10,648.99

AMOUNTS PAID FOR RENTAL OF THE SUBWAY.

The following sums have been paid during the year by the Boston Elevated Railway Company for the use of the subway:

Sept. 30, 1908:			
Net cost of subway	\$4,100,803.47		
One quarter's rental		\$49,978.54	
Alterations: net cost	242,673.93		
One quarter's rental		2,957.59	
Dec. 31, 1908:			
Net cost of subway	4,100,803.47		
One quarter's rental		49,978.54	
Alterations: net cost	242,673.93		
One quarter's rental		2,957.59	
March 31, 1909:			
Net cost of subway	4,100,803.47		
One quarter's rental		49,978.54	
Alterations: net cost	242,673.93		
One quarter's rental		2,957.59	
June 30, 1909:			
Net cost of subway	4,100,864.27		
One quarter's rental		49,979.28	
Alterations: net cost	242,673.93		
One quarter's rental		2,957.59	
		<u>\$211,745.26</u>	
Received on toll account		<u>11,578.17</u>	

STATEMENT OF EXPENSES.

The following is a classified statement of the expenses of the Commission for the year ending June 30, 1909:

SUBWAY.			
Field supplies	\$60.80	\$60.80	
EAST BOSTON TUNNEL.			
General Expenses:			
Office—Stationery and printing	\$19.03		
Supplies	1.94		
		<u>20.97</u>	
ENGINEERING DEPARTMENT.			
Rooms—Supplies	\$227.53		
Stationery and printing	19.03		
Skilled service	3,693.99		
		<u>3,940.55</u>	
MISCELLANEOUS.			
Field supplies	\$649.92		
Labor	3,091.10		
Teaming	118.12		
		<u>3,859.14</u>	
Carried forward		\$7,881.46	

<i>Brought forward</i>		\$7,881.46	
	SECTION A.		
Labor	\$0.23		.23
	SECTION B.		
Construction	\$728.44		
Field supplies	533.73		
Labor	991.77		
Office supplies	827.78		
Skilled service	354.96		
Water pipes	36.05		
		3,472.73	
	SECTION C.		
Field supplies	\$2,613.32		
Credit:			
Construction	44.50		
		2,568.82	
	SECTION D.		
Field supplies	\$77.93		
		77.93	
	SECTION F.		
Advertising	\$3.85		
Construction	2,928.82		
Field supplies	15.15		
Inspection	25.81		
Labor	91.29		
Skilled service	9.00		
	\$3,073.92		
Credit:			
Transfer to Boston Tunnel and Subway.	406.00		
		2,667.92	

BOSTON TUNNEL AND SUBWAY.

General Expenses:			
Office—Lighting	\$79.44		
Printing	1,292.48		
Rental	3,000.00		
Repairs	16.30		
Stationery-supplies	474.81		
Telephone-telegraph	120.20		
Stenographers	2,981.04		
Messenger	936.00		
Clerks	1,040.00		
Salaries of Commissioners and Secretary	23,917.00		
	\$33,857.27		
Transferred to Cambridge Connection.	4,004.59		
		29,852.68	
	ENGINEERING DEPARTMENT.		
Rooms—Fuel	\$98.27		
Furniture	23.26		
Lighting	559.26		
<i>Carried forward</i>	\$680.79	\$46,521.77	

<i>Brought forward</i>	\$680.79	\$46,521.77
Printing	2,381.09	
Rental	3,333.32	
Stationery-supplies	1,263.65	
Telephone-telegraph	328.88	
	<hr/>	7,987.73

MISCELLANEOUS.

Chief Engineer	\$10,500.00	
Field supplies	277.58	
Instruments	53.50	
Insurance	100.00	
Labor	5,969.13	
Legal and expert advice	864.34	
Messengers	1,571.12	
Skilled service	25,324.44	
Stenographers	2,951.76	
Teaming	168.92	
Testing	460.56	
Tools	173.47	
Travel	12.67	
	<hr/>	\$48,427.49
Transfers:		
Advertising	\$8.49	
Borings:		
Labor	475.18	
Materials	15.42	
Stock	3,985.99	
Water pipes	35.45	
	<hr/>	4,520.53
		43,906.96

SECTION ONE.

(From westerly side of Ash street opposite Nassau street to a point in Washington street near southerly side of Eliot and Kneeland streets.)

Construction	\$502.08	
Field supplies	306.80	
Labor	685.60	
Legal and expert advice	5.00	
Lighting	54.56	
Property damages: Takings	44,500.00	
Skilled service	77.63	
Teaming	4.60	
	<hr/>	46,136.27

SECTION TWO.

(From near the southerly side of Eliot and Kneeland streets to near the northerly side of Boylston street.)

Boylston street station:		
Chas. R. Gow Co. (Contract No. 311)	\$1,079.51	
Miscellaneous	7,121.18	
Construction	698.35	
Field supplies	2.23	
Labor	273.30	
LaGrange street station:		
Miscellaneous	1,966.23	
<i>Carried forward</i>	<hr/>	<hr/>
	\$11,140.80	\$144,552.73

<i>Brought forward</i>	\$11,140.80	\$144,552.73
Paving	49.79	
Skilled service	210.70	
Stationery-supplies	1.12	
Tools	8.40	
Water pipes	10.49	
	<hr/>	11,421.30

SECTION THREE.

(From near the northerly side of Boylston street to about 30 feet north of the northerly side of Hayward place.)

Construction	\$298.47	
Essex street station:		
Miscellaneous	8,850.15	
Hayward place station:		
Chas. R. Gow Co. (Contract No. 315)	828.93	
Miscellaneous	3,367.54	
Labor	129.11	
Paving	82.87	
Skilled service	209.52	
Stationery-supplies	2.50	
	<hr/>	\$13,769.09
Credit:		
Water pipes	21.76	
	<hr/>	13,747.33

SECTION FOUR.

(From about 30 feet north of Hayward place to about 50 feet south of Franklin street.)

Construction	\$1,059.91	
Insurance	35.50	
Labor	282.42	
Lighting	17.30	
Paving	1,229.63	
Property damages: Takings	156,643.12	
Skilled service	398.69	
Stationery-supplies	2.94	
Summer street station:		
Patrick McGovern (Contract No. 322)	203.00	
Miscellaneous	7,289.06	
Temple place station:		
John E. Palmer (Contract No. 309)	499.44	
Miscellaneous	2,802.88	
Tools	13.53	
Water pipes	312.93	
Winter street station:		
Patrick McGovern (Contract No. 316)	1,182.87	
Miscellaneous	8,133.23	
	<hr/>	180,106.45

SECTION FIVE.

(From about 50 feet south of Franklin street to near Court avenue.)

Coleman Bros. (Contract No. 240)	\$4,919.53	
Alterations	16.15	
Construction	1,200.24	
	<hr/>	
<i>Carried forward</i>	\$6,135.92	\$349,827.81

<i>Brought forward</i>	\$6,135.92	\$349,827.81
Damages	650.00	
Field supplies	67.40	
Franklin street station:		
Miscellaneous	2,230.57	
Labor	1,460.03	
Legal and expert advice	64.44	
Old South Meeting House station:		
Coleman Bros. (Contract No. 294)	3,206.30	
Miscellaneous	13,011.05	
Paving	51.12	
Property Damages: Takings	3,499.30	
Skilled service	323.55	
Stationery-supplies	2.25	
Telephone-telegraph	.20	
Tools	5.78	
Water pipes	20.31	
Water street station:		
Coughlan & Sheils Co. (Contract No. 319)	186.56	
Miscellaneous	1,542.74	
		32,457.52

SECTION SIX.

(From near Court avenue to the north side of the East Boston tunnel.)

Patrick McGovern (Contract No. 308)	\$2,457.76	
Coleman Bros. (Contract No. 333)	291.47	
Coleman Bros. (Contract No. 337)	49.56	
Coleman Bros. (Contract No. 348)	357.40	
Coleman Bros. (Contract No. 352)	849.11	
Reno Inclined Elevator Co. (Contract No. 346)	5,298.00	
Reno Inclined Elevator Co. (Contract No. 347)	7,706.00	
Wm. H. Smith (Contract No. 338)	8,171.12	
E. B. Badger & Sons Co. (Contract No. 360)	1,494.00	
Alterations	117.76	
Construction	7,770.04	
Damages	100.00	
Field supplies	308.02	
Labor	12,111.21	
Lighting	217.70	
Paving	3,787.82	
Skilled service	477.73	
Stationery-supplies	2.78	
Teaming	1.40	
Telephone-telegraph	5.01	
Tools	66.91	
Water pipes	1,434.75	
		53,075.55

SECTION SEVEN.

(From the north side of the East Boston tunnel to 150 feet north of State street.)

Construction	\$73.50	
Labor	183.05	
Paving	885.37	
Skilled service	61.13	
<i>Carried forward</i>	\$1,203.05	\$435,360.88

<i>Brought forward</i>	\$1,203.05	\$435,360.88
Tools	4.83	
Underpinning	17.75	
Water pipes	22.84	
	<hr/>	1,248.47

SECTION EIGHT.

(From 150 feet north of State street to Hanover street.)

Adams square station:		
Miscellaneous	\$725.66	
Construction	267.54	
Damages	500.00	
Field supplies . . . . .	.45	
Labor	523.11	
Lighting	92.96	
Paving	1,677.85	
Skilled service	73.45	
Tools	8.77	
Water pipes	2.58	
	<hr/>	\$3,872.37
Credit:		
Portland street sewer:		
Coleman Bros. (Contract No. 258)	50.40	
	<hr/>	3,821.97.

SECTION NINE.

(From Hanover street to Haymarket square.)

James J. Coughlan Construction Co. (Contract No. 263)	\$4,207.86	
Wm. H. Smith-Co. (Contract No. 366)	3,497.25	
Alterations	215.39	
Construction	3,496.29	
Damages	86.03	
Field supplies	85.79	
Labor	3,620.73	
Lighting	105.93	
Paving	272.85	
Skilled service	360.26	
Telephone-telegraph	1.20	
Testing	711.89	
Tools	29.85	
Union street station:		
J. J. Coughlan Construction Co. (Contract No. 263)	175.72	
W. A. Murtfeldt Co. (Contract No. 321)	111.75	
Miscellaneous	17,920.58	
Water pipes	47.79	
	<hr/>	34,947 16

SECTION TEN.

(In Haymarket square for a length of about 300 feet, on the easterly side of the old subway.)

Coleman Bros. (Contract No. 269)	\$1,261.81	
Hugh Nawn Contracting Co. (Contract No. 363)	1,178.50	
	<hr/>	
<i>Carried forward</i>	\$2,440.31	\$475,378.48

<i>Brought forward</i>	\$2,440.31	\$475,378.48
New England Structural Co. (Contract No. 362)	1,043.08	
Construction	397.00	
Damages	625.00	
Field supplies	1.11	
Fuel	1.75	
Inspection	21.03	
Labor	424.91	
Lighting	29.89	
Paving	133.33	
Skilled service	508.37	
Teaming	17.25	
Tools	26.90	
		5,669.93

SECTION ELEVEN.

(From the northerly side of Section Ten to portal of old subway.)

American Bridge Co. (Contract No. 350)	\$11,320.57	
Coleman Bros. (Contract No. 285)	1,498.06	
Coleman Bros. (Contract No. 357)	16,082.27	
Coleman Bros. (Contract No. 364)	347.75	
Coughlan & Sheils Co. (Contract No. 329)	2,960.17	
Hugh Nawn Contracting Co. (Contract No. 365)	130,115.44	
John E. Palmer (Contract No. 351)	7,774.08	
Advertising	34.83	
Alterations	75.78	
Construction	13,823.99	
Field supplies	212.86	
Fuel	14.00	
Inspection	80.00	
Instruments	11.10	
Labor	5,015.10	
Lighting	29.00	
Paving	800.50	
Protection of tenants	59.79	
Skilled service	3,265.00	
Stationery-supplies	20.17	
Teaming	44.72	
Telephone-telegraph	1.19	
Tools	99.36	
Relief station: Alterations and Additions:		
Kendall, Taylor & Co., Architects	972.84	
Whitcomb & Kavanaugh	21,481.54	
Ingalls & Kendrick	3,619.43	
Wm. H. Mitchell & Son Co.	2,679.40	
T. T. Kelly & Co.	723.91	
Miscellaneous	4,705.93	
Underpinning	4.22	
		227,873.00

SECTION TWELVE.

(Everything north of the northerly line of the original building of the Relief Station of the Boston City Hospital.)

Chas. R. Gow Co. (Contract No. 330)	\$1,662.84	
Construction	3.00	
Labor	28.98	
<i>Carried forward</i>	\$1,694.82	\$708,921.41

<i>Brought forward</i>	\$1,694.82	\$708,921.41
Paving	70.13	
Travers street sub-passageway:		
Hugh Nawn Contracting Co. (Contract		
No. 345)	2,558.89	
Miscellaneous	2,807.93	
	<hr/>	7,131.77

PLEASANT STREET CHANGES.

Changes made necessary to adapt the		
Tremont street subway for use by sur-		
face cars after the removal of the elevated		
train service therefrom to the Washington		
street tunnel (Chap. 534, Acts 1902) .	\$4,631.93	4,631.93

RIVERBANK SUBWAY.

Office Expenses:		
Printing	\$57.10	
Stationery-supplies	5.81	
	<hr/>	62.91
Engineering Expenses:		
Printing	\$57.10	
Skilled service	219.33	
Stationery-supplies	5.82	
	<hr/>	282.25

CAMBRIDGE CONNECTION.

Office Expenses:		
Printing	\$19.03	
Stationery-supplies	11.33	
Stenographer	10.00	
Proportion of General Expenses trans-		
ferred from Boston Tunnel and Subway	4,004.59	
	<hr/>	4,044.95
Engineering Expenses:		
Advertising	\$30.90	
Borings:		
P. J. Healey	904.40	
Labor	1,096.14	
Materials	16.17	
Chief Engineer	1,500.00	
Damages	30.66	
Field supplies	23.34	
Furniture	7.24	
Inspection	21.16	
Instruments	74.03	
Labor	521.00	
Lighting	1.63	
Messengers	182.90	
Printing	72.69	
Rental	15.00	
Skilled service	9,574.16	
Stationery-supplies	273.69	
Stenographers	408.44	
Stock	2,007.02	
	<hr/>	
<i>Carried forward</i>	\$16,760.57	\$725,075.22

<i>Brought forward</i>	\$16,760.57	\$725,075.22
Telephone-telegraph	34.80	
Tools	1.82	
Water pipes	35.45	
	<hr/>	16,832.64

SECTION ONE.

(From a point about 130 feet northwesterly from the corner of Grove and Phillips streets to a point on Boston Common about 220 feet southeasterly from Beacon street.)

John E. Palmer (Contract No. 368)	\$6,102.77	
Phoenix Iron Co. (Contract No. 380)	712.87	
Advertising	91.10	
Alterations	36.00	
Borings	261.97	
Construction	5,395.06	
Field supplies	1,285.93	
Inspection	69.96	
Labor	23.00	
Lighting	137.30	
Printing	361.54	
Rental	45.00	
Teaming	972.40	
Tools	20.82	
	<hr/>	15,515.72

INTEREST.

Boston Tunnel and Subway	\$234,314.05	
Riverbank Subway	100.00	
	<hr/>	234,414.05
Grand Total		<hr/> \$991,837.63

SUMMARY.

	From Beginning of work to June 30, 1908.	June 30, 1908, to June 30, 1909.	Total.
Subway—Subway			
Commission	\$14,131.16		\$14,131.16
Part of General			
Expenses	117,473.24		117,473.24
Engineering and			
Miscellaneous	407,475.48		407,475.48
Section One	239,407.12		239,407.12
Two	363,605.50		363,605.50
Three	300,639.36		300,639.36
Three and			
one half	9,355.70		9,355.70
Four	469,620.33		469,620.33
Five	388,894.69	\$60.80	388,955.49
Six	327,541.86		327,541.86
Seven	231,504.27		231,504.27
Eight	95,888.08		95,888.08
Eight and			
one half	76,639.47		76,639.47
<i>Carried forward</i>	<hr/> \$3,042,176.26	<hr/> \$60.80	<hr/> \$3,042,237.06

BOSTON TRANSIT COMMISSION.

	From Beginning of work to June 30, 1908.	June 30, 1908, to June 30, 1909.	Total.
<i>Brought forward</i>	\$3,042,176.26	\$60.80	\$3,042,237.06
Section Nine . . .	299,452.07		299,452.07
Ten . . .	254,497.88		254,497.88
Eleven . . .	270,310.57		270,310.57
Interest . . .	258,575.60		258,575.60
	<u>\$4,125,012.38</u>	<u>\$60.80</u>	<u>\$4,125,073.18</u>
Transfer to Altera- tions, see 11th report . . .	4.95		4.95
Total . . .	<u>\$4,125,007.43</u>	<u>\$60.80</u>	<u>\$4,125,068.23</u>
Alterations — Part of General Ex- penses . . .	\$28,945.53		\$28,945.53
Section Three . . .	2,568.26		2,568.26
Four . . .	163.42		163.42
Five . . .	30,233.01		30,233.01
Seven . . .	178,516.16		178,516.16
Nine . . .	3.00		3.00
Ten . . .	534.04		534.04
Interest . . .	1,905.56		1,905.56
Transfer from Sub- way, see 11th re- port . . .	4.95		4.95
Total . . .	<u>\$242,873.93</u>		<u>\$242,873.93</u>
Charlestown Bridge: Total . . .	<u>\$1,570,197.98</u>		<u>\$1,570,197.98</u>
East Boston Tun- nel—Part of Gen- eral Expenses . . .	\$161,010.72	\$20.97	\$161,031.69
Engineering Ex- penses . . .	176,530.01	7,799.69	184,329.70
Section A . . .	98,866.61	.23	98,866.84
B . . .	1,367,308.20	3,472.73	1,370,780.93
C . . .	491,778.39	2,568.82	494,347.21
D . . .	244,745.05	77.93	244,822.98
E . . .	188,201.14		188,201.14
F . . .	232,232.36	2,667.92	234,900.28
Interest . . .	248,156.88		248,156.88
Total . . .	<u>\$3,208,829.36</u>	<u>\$16,608.29</u>	<u>\$3,225,437.65</u>
Boston Tunnel and Subway—Part of General Ex- penses . . .	\$182,004.87	\$29,852.68	\$211,857.55
Engineering Ex- penses . . .	355,167.28	51,894.69	407,061.97
Section One . . .	778,753.51	46,136.27	824,889.78
Two . . .	626,078.88	11,421.30	637,500.18
Three . . .	446,498.50	13,747.33	460,245.83
Four . . .	1,536,904.23	180,106.45	1,717,010.68
Five . . .	998,230.78	32,457.52	1,030,688.30
<i>Carried forward</i>	<u>\$4,923,638.05</u>	<u>\$365,616.24</u>	<u>\$5,289,254.29</u>

	From Beginning of work to June 30, 1908.	June 30, 1908, to June 30, 1909.	Total.
<i>Brought forward</i>	\$4,923,638.05	\$365,616.24	\$5,289,254.29
Section Six . .	268,873.09	53,075.55	321,948.64
Seven . .	137,838.67	1,248.47	139,087.14
Eight . .	490,757.46	3,821.97	494,579.43
Nine . .	508,923.44	34,947.16	543,870.60
Ten . .	133,693.76	5,669.93	139,363.69
Eleven . .	108,261.59	227,873.00	336,134.59
Twelve . .	38,281.50	7,131.77	45,413.27
Pleasant street .		4,631.93	4,631.93
Interest . .	413,865.76	234,314.05	648,179.81
Total . .	<u>\$7,024,133.32</u>	<u>\$938,330.07</u>	<u>\$7,962,463.39</u>
Investigation of Con- gestion of Traf- fic, etc.			
Office Expenses	\$94.46		\$94.46
Engineering Ex- penses . .	2,921.46		2,921.46
Total . .	<u>\$3,015.92</u>		<u>\$3,015.92</u>
Riverbank Subway			
Office Expenses	\$117.66	\$62.91	\$180.57
Engineering Ex- penses . .	1,566.74	282.25	1,848.99
Interest . .	61.51	100.00	161.51
Total . .	<u>\$1,745.91</u>	<u>\$445.16</u>	<u>\$2,191.07</u>
Cambridge Conne- ction—Office Ex- penses . .		\$4,044.95	\$4,044.95
Engineering Ex- penses . .		16,832.64	16,832.64
Section One . .		15,515.72	15,515.72
Total . .		<u>\$36,393.31</u>	<u>\$36,393.31</u>
Grand Total . .	<u>\$16,175,803.85</u>	<u>\$991,837.63</u>	<u>\$17,167,641.48</u>

The report of the Chief Engineer is appended.

GEORGE G. CROCKER,	} <i>Boston</i> <i>Transit</i> <i>Commission.</i>
GEORGE F. SWAIN,	
HORACE G. ALLEN,	
JOSIAH QUINCY,	



REPORT OF THE CHIEF ENGINEER.

BOSTON, JUNE 30, 1909.

GEORGE G. CROCKER, GEORGE F. SWAIN, HORACE G. ALLEN,
JOSIAH QUINCY, *Boston Transit Commissioners.*

GENTLEMEN:—My report for the year ending on this date, submitted herewith, refers, among other matters, to the completing of the Washington-street Tunnel; to the changes in the Subway to restore it to its former use by surface cars; to the enlargement and changes at Haymarket-square station to facilitate transfers of passengers between the old Subway and the Washington-street Tunnel; to the East Boston tunnel; and to the preparations for beginning the Beacon Hill Tunnel for the Cambridge Connection.

WASHINGTON STREET TUNNEL.

The work, begun last year, of finishing inside of the stations, including plastering, tiling, putting up fences, installing inclined elevators at the State station, etc., was completed about November 30, 1908, having occupied altogether thirteen months. The interior finish is much more elaborate in the Washington-street Tunnel than the plain white tiling finish used in the old Subway and the East Boston Tunnel, required about three times as long to put in, and cost directly, and especially indirectly, several times as much. The elaborate finish is probably, however, more satisfactory to the majority of the traveling public.

Trains of cars which, according to law, had been removed from the old Subway, began to run in the Washington-street Tunnel Monday morning, November 30, 1908. The changes in the structure of the Subway which were necessary for restoration to its original use by street cars, consisting in part of alterations at the Pleasant-street incline and in part of the enlargement of the Haymarket-square station, were made by the Transit Commission, and are described in detail later. These

changes could not be completed while trains were running in the Subway, and during the time necessary to make those at Haymarket square the large transfer of passengers between the elevated trains and the subway cars took place under somewhat cramped and unfavorable conditions at the Causeway-street station of the elevated road.

STATISTICAL TABLES.

Following the method adopted in former reports, the leading statistical data in regard to the year's work are embodied in Tables 1 to 4, inclusive. These are followed by brief descriptive statements dealing with the more important branches of work.

No. 1.—CONSTRUCTION.

SECTION, ETC.	Location or Description of Work.	Plates in This Report.	Assistant Engineer.	Contractor and Date of Contract.	Amount of Contract.	Appendices showing Bids in This and Previous Annual Reports.	Date of Completion Named in Contract.
Changes and additions to the Subway near Haymarket square.	Building concrete wall and foundation piers under the Relief Station.	XV, 7, S.	W. O. Wellington.	John E. Palmer, May 8, 1908.	\$12,635.00	XIV, HH.	July 25, 1908. (Certificate of Completion, July 11, 1908.)
	Building a portion of the Subway walls, roof and invert under the Relief Station.	XV, 7, S.	W. O. Wellington.	Coleman Bros. July 20, 1908.	\$17,050.00	XV, I.	October 1, 1908. (Certificate of Completion, October 28, 1908.)
	Cutting out old Subway easterly concrete wall, etc., and removing steel-work.	XV, 7, S.	W. O. Wellington.	Hugh Nawn Contracting Co., November 12, 1908.	\$859.50	XV, U.	December 25, 1908. (Certification of Completion, December 15, 1908.)
	Cutting holes, placing beams and building a portion of the Subway roof under the Relief Station.	XV, 7, S.	W. O. Wellington.	Coleman Bros. November 21, 1908.	\$419.00	.....	December 3, 1908. (Certificate of Completion, December 4, 1908.)
	Enlargement of Haymarket Square Station and building of sub-passageway for transfers to and from Washington-street Tunnel.	XV, 7, S.	W. O. Wellington.	Hugh Nawn Contracting Co., December 24, 1908.	Cost plus 15% (About \$130,000.)	.....	Completed May 22, 1909.
State Station.	Furnishing and erecting one single-file and one double-file Reno Inclined Elevators. (South side.)	XV, 6.	W. W. Lewis.	The Reno Inclined Elevator Co., April 1, 1908.	\$9,920.00	Bids filed, but not appended.	July 15, 1908. (Certificate of Completion, June 12, 1908. Satisfactorily tested October 7, 1908.)
	Furnishing and erecting two single-file Reno Inclined Elevators (North side.)	.....	W. W. Lewis.	The Reno Inclined Elevator Co., April 6, 1908.	\$7,400.00	Bids filed, but not appended.	September 1, 1908. (Certificate of Completion, July 31, 1908. Satisfactorily tested November 25, 1908.)
Alterations at Pleasant-street Incline, to re-adapt it to the use of surface cars.	Preparing for and storing filling material, building catch basins, etc.	.....	W. O. Wellington.	Mostly Coleman Bros.	Cost plus 15% (About \$1,275.00)	.....	.....
	Placing 2,000 cu. yds. of filling material in open incline.	.....	W. O. Wellington.	Coughlan & Sheils Co., November 25, 1908.	\$875.00	XV, V.	December 2, 1908. (Certificate of Completion, December 2, 1908.)
Station Tiling.	Milk Station.	XV, 5.	L. B. Manley.	The C. M. Tyler Co., February 4, 1908.	\$10,937.75	XIV, T.	Certificate of Completion, July 22, 1908.
	State Station.	XV, 6.	L. B. Manley.	William H. Smith, February 5, 1908.	25,383.50	XIV, T.	Certificate of Completion, August 31, 1908.
	Union-Friend Station.	.....	L. B. Manley.	Murdock-Sbaw Co., February 12, 1908.	\$16,500.70	XIV, T.	Certificate of Completion, August 1, 1908.
	Sub-passageway between Union-Friend and Haymarket-square stations.	.....	L. B. Manley.	William H. Smith Co., January 5, 1909.	\$3,681.33	.....	Certificate of Completion, April 22, 1909.
All Stations.	Furnishing and installing bronze-covered doors, windows, etc.	.....	L. B. Manley.	John W. Rapp, June 12, 1908.	\$6,935.15	.....	August 28, 1908. (Certificate of Completion, October 15, 1908.)

No. 2.—PROGRESS OF CONSTRUCTION.

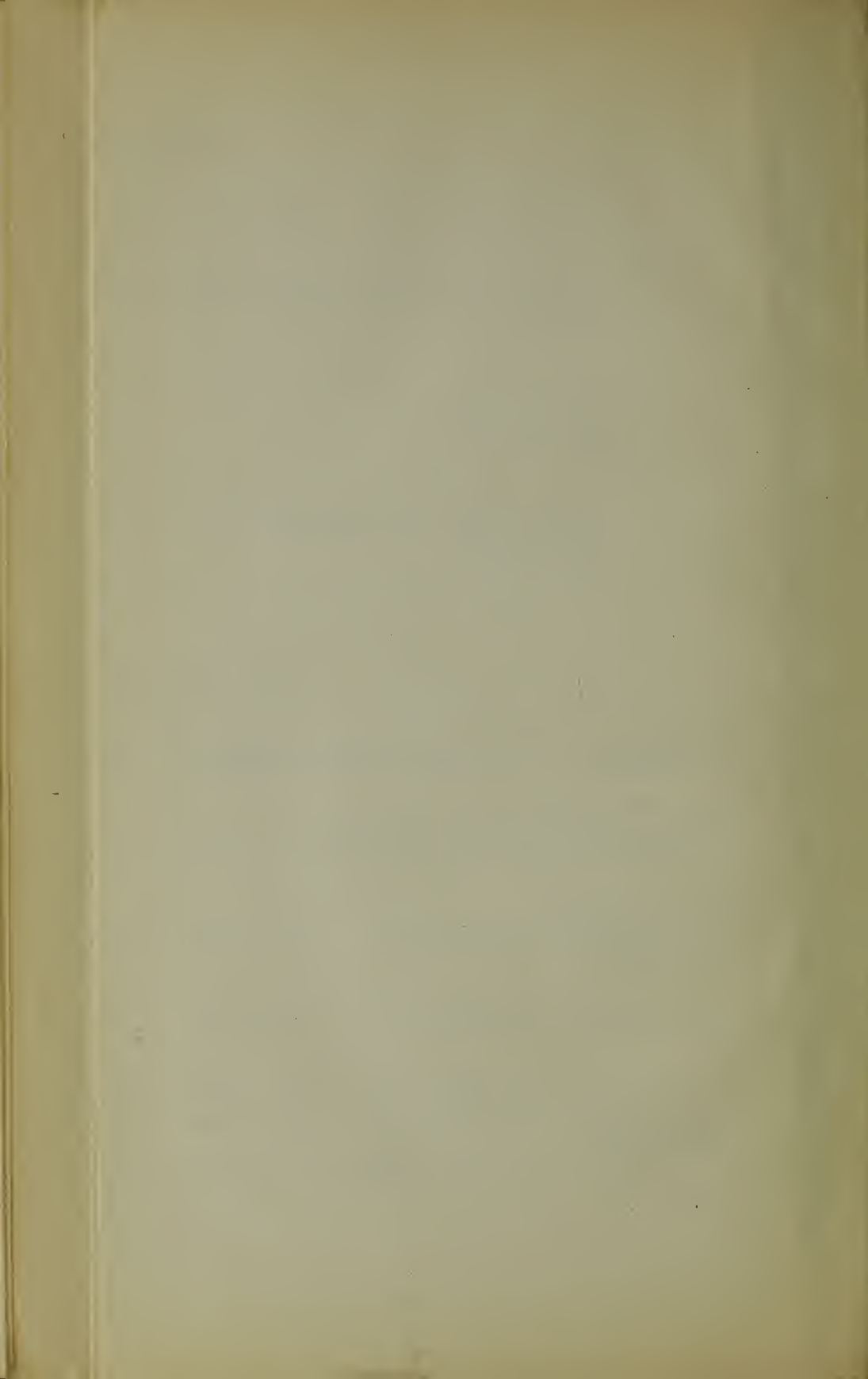
SECTION, LOCATION OR DESCRIPTION OF WORK.	Dates of Beginning.		Dates of Completion.		Amount of Work Done, Year Ending June 30, 1909.		Total Amount of Work Done to and Including June 30, 1909, from Beginning of Work.		Number of Men Ordinarily Employed by the Con- tractor, Year Ending June 30, 1909.	
	Excavation.	Concrete.	Excavation.	Concrete.	Excavation in cu. yds.	Concrete in cu. yds.	Excavation in cu. yds.	Concrete in cu. yds.	Day	Night
Building concrete wall and founda- tion piers under the Relief Station.	May 12, 1908.	June 2, 1908.	July 11, 1908 (includ- ing 200 cu. yds. ad- ditional.)	July 11, 1908.	548	14	1248 (in- cluding 200 cu. yds. ad- ditional.)	402	15	12
Building a portion of the Subway walls, roof and invert un- der the Relief Sta- tion.	July 20, 1908.	July 30, 1908.	Oct. 16, 1908.	Oct. 24, 1908.	662	700	662	700	25	....
Enlargement of Hay- market-square Sta- tion and building of sub-passageway for transfers to and from Washington- street Tunnel.	Dec. 17, 1908.	Dec. 16, 1908.	April 6, 1909.	May 13, 1909.	2244	2780	2244	2780	150	100
Tiling, Milk Station.	Feb. 4, 1908.		July 22, 1908.		16 sq. yds. enameled til- ing. 164 sq. yds. ceramic mo- saic.		1304 sq. yards. half- ribbed tiling. 622 sq. yards enameled tiling. 1050 sq. yds. ceramic mosaic.		7	...
Tiling, State Station.	Feb. 5, 1908.		Aug. 31, 1908.		147 sq. yds. enameled til- ing. 260 sq. yds. ceramic mo- saic.		1578 sq. yds. half- ribbed tiling. 1026 sq. yds. enameled tiling. 1144 sq. yds. ceramic mosaic.		8	....
Tiling, Union-Friend Station.	Feb. 12, 1908.		Aug. 1, 1908.		636 sq. yds. ceramic mo- saic.		743 sq. yds. half- ribbed tiling. 453 sq. yds. enameled tiling. 2331 sq. yards ceramic mosaic.		9	....
Tiling, sub-passageway between Union- Friend and Hay- market-square sta- tions.	Jan. 7, 1909.		April 22, 1909		416 sq. yds. half-ribbed tiling. 264 sq. yards. enameled tiling. 238 sq. yds. ceramic mo- saic.		416 sq. yds. half-ribbed tiling. 264 sq. yds. enameled tiling. 238 sq. yds. ceramic mosaic.		7	...

No. 3.—EXCAVATION DATA.

LOCATION OR DESCRIPTION OF WORK.	CHARACTER OF EARTH FOUND IN EXCAVATION.	Disposition of Surplus.
Building concrete wall and foundation piers under the Relief Station.	Filling to 13 feet below basement floor; then 11 to 12 feet of peat. Hard blue clay below the peat.	Mostly to Charles River Embankment.
Building a portion of the subway walls, roof and invert under the Relief Station.	As above.	As above.
Enlargement of Haymarket Square Station and building of sub-passageway.	Excavation was all below the invert of the Tremont-street Subway, in stiff blue clay.	As above.

No. 4.—CONSTRUCTIONAL STEELWORK.

LOCATION OR DESCRIPTION OF WORK.	Contractor for Furnishing Steelwork (Year Ending June 30, 1909) and Date of Contract.	Amount of Contract.	Appendices in this Report, Showing Bids.	Date of Completion Named in Contract.	Date of Certificate of Completion.
Changes and additions to the Subway, near Haymarket square.	New England Structural Co., Nov. 10, 1908.	\$780.00	XV, T.	1st Instalment, Nov. 30, 1908. 2d Instalment, Dec. 15, 1908.	Nov. 20, 1908.
Connection between the East Boston Tunnel and the Subway in Scollay square.	Bethlehem Steel Co., Feb. 19, 1909.	\$2,709.00	XV, Y.	April 2, 1909.	March 31, 1909.
Tunnel under Beacon Hill.	Phoenix Iron Co., March 19, 1909.	\$759.50	XV, AA.	May 1, 1909.	April 28, 1909.
Twisted Steel Reinforcing Rods.	Harrington, Robinson & Co., Dec. 7, 1908	\$1,314.00	XV, W.	Dec. 30, 1908.	Jan. 2, 1909.
	Wm. H. Perry Co., Feb. 11, 1909.	\$1,992.00	XV, Z.	March 18, 1909.	Rods received March 9 to 12, 1909.
	Eastern Expanded Metal Co., April 1, 1909.	\$4,794.00	XV, FF.	May 15, 1909.	Rods received April 22 to 28, 1909.



INTERIOR FINISH OF STATIONS.

The work has consisted of completing contracts for tiling, plastering, painting, etc., of the previous year and equipping the tunnel stations with partitions (for booths, toilet rooms, etc.,) elevators, hand-rails, grilles and fences necessary for the safety and convenience of the public. This work has been done in co-operation with the Elevated Railway Co. which has installed the operating equipment, including ballast, tracks, signals, ducts, ticket offices, choppers, signs and fences required in handling crowds of people. All of the furnishings have been specially designed and are fireproof throughout.

The most important item of finish, both in time and money expended, has been the tile work. About 15,600 square yards of tile have been set on the tunnel walls and ceilings. The work in the main tunnel was done in six contracts and occupied about one year, the length of time required to complete the work being largely due to many architectural details and to numerous additions which were suggested and made as the work progressed. Plates 2, 3, 4 and 5 will give an idea of the general appearance and some of the details of the station platforms. Additional tile work in the subpassageway between the Union and Friend Stations and the Haymarket-square Station of the Subway has been done during the current year after the cars had begun running in the Washington-street tunnel and before the completion of alterations in the Haymarket-square station.

COMPLETION OF THE RENO INCLINED ELEVATORS UNDER STATE STREET NORTH.

Contracts were awarded to the Reno Inclined Elevator Company in April, 1908, for furnishing and erecting at the State station one double-file elevator having a capacity for carrying 7000 passengers per hour, and three single-file inclined elevators each with a capacity of 3500 per hour, and a description of these machines was given in the Fourteenth Annual Report. Of these the double-file and one single-file (see Plate 6), located under State street south, were substantially completed last year. The remaining two single-file elevators, located under State street north, have been completed this year, and all four have been accepted.

BUILDING A PORTION OF SUBWAY FOR NEW TRACKS (Nos. 5
AND 6) UNDER CITY HOSPITAL RELIEF STATION.

The inverts, walls and roof are made of reinforced concrete and the Hospital is supported thereon.

The lower portion of the westerly wall of the Subway in this precise locality and of two walls between tracks are beneath the floor of the original boiler room and stable of the Relief Hospital. So much of this subway construction as could be done without disturbing the hospital had been practically finished by the end of June, 1908, and is described on page 41 of the Fourteenth Annual Report.

In the latter part of July, 1908, the new wing of the hospital, providing a new boiler room and stable, had been largely completed, allowing the original boiler room and stable to be vacated. A contract was then made with Coleman Brothers, the lowest bidders, for completing the work under the Hospital. Their contract included building the upper portion of the subway which projected into the old vacated premises, excavation of earth core and also constructing inverts for the two westerly tracks.

The basement floor within the limits of the proposed structure was removed and the partially built Subway walls were carried up to the elevation for the under side of the finished Subway roof, leaving the interior posts of the Relief Station on their original foundations. These posts were then permanently supported on deep channel girders riveted to the flanges of the posts and resting on the newly completed Subway walls. The old foundations for the columns were then removed; the piles of the old column foundations were cut off to sub-invert level and additional piles for the Subway structure were driven. The reinforced concrete invert and roof were then built.

The front wall and portico of the Relief Station also rest on beams spanning the Subway roof. These were placed in position for the Contractor by Isaac Blair & Co.; the work being carried on wholly below the surface, thus entirely avoiding the use of spur shores, needle beams or other obstructions in front of the building.

ENLARGEMENT AND CHANGES AT HAYMARKET SQUARE STATION
TO FACILITATE TRANSFERS OF PASSENGERS BETWEEN THE
OLD SUBWAY AND THE WASHINGTON STREET TUNNEL.

A large number of passengers traveling between their homes and their places of business find it necessary or convenient to make part of each journey on the trains of the elevated structure and the Washington-street tunnel and part by the cars which pass through the old Subway. This question was carefully studied by the Transit Commission and the officers of the Elevated Co. at the time when the route of the Washington-street Tunnel through and north of Adams square was determined on. The most convenient place for a transfer was found to be at Haymarket Square, and a general plan for the enlargement of the Haymarket-square station and for the construction of a passageway connecting this with the Union-Friend Station was then drawn. The construction has been made substantially in accordance with said plan, and is illustrated by Plates 7 and 8 which show the enlarged platforms, the new arrangement of tracks, the transfer passageways, etc.

As will be noted by reference to Plate 7, the original station of the Subway at Haymarket Square is entirely enclosed in the new structure, whose boundary on the east is the Washington-street Tunnel and on the west a new wall, a portion of which was built in 1907. A contiguous portion of the Subway, for tracks numbered 5 and 6, has been continued under the Relief Hospital during the present year, as described on page 32.

Between 12.30 and 7.30 Sunday morning, Nov. 29, 1908, 36 old Subway columns were removed and 39 new columns erected at the junction of the Washington-street Tunnel with the old Subway, so that the rails making the connection with the Washington-street Tunnel could have been laid and trains run through this particular locality the same morning. On account of changes outside of the Subway the tracks were not laid until Sunday afternoon, and public service began Monday morning. At this time the old Subway Station in Haymarket Square was substantially intact inside of the outlines of the enlarged station. The work of transformation has consisted of:

1. Tearing away 330 ft. of old wall on the east side and 520 ft. on the west side and rebuilding 40 ft. of easterly and 100

ft. of westerly curved new wall to connect the new and the old work, the lengths being stated approximately.

2. Remodeling and extending the roof.
3. Rebuilding the station platforms.
4. Building the subpassageway beneath the track to the Union and Friend Stations of the Washington-street Tunnel.

This work has progressed through carefully planned phases so as not to interfere with the use of the station. The general method of operation has been to do the work on the east side first while the cars were running on the west side, then the work in the center with the cars on each side, and finally that on the west side while the cars were running on the east side.

A portion of the easterly wall, about 200 feet long and 20 inches thick and for about two-thirds of this length the 15 foot I-beam posts 6 feet apart, were removed under a contract with the Hugh Nawn Contracting Company.

The other old walls removed, including irregular back walls, were considerably thicker, and contained curved and straight columns 3 ft. and 6 ft. apart respectively to which the roof beams were attached. The roof was first supported either permanently by means of new interior columns and girders or temporarily on 12 inch square timbers on jacks resting on the subway invert. The concrete in the walls was then removed by drilling holes about 6 inches apart each way through it with air drills and finally breaking it out with hammers and wedges. The columns were then removed and in the case of new connecting walls were set back to their new location and the roof beams spliced out to fill the gap. The new concrete wall was then built between and around the columns. Most of the concrete taken from the old structure was crushed and used as aggregate in the new concrete.

The new arrangement of tracks, requiring longer roof spans, different points of support, and changes in grade, necessitated the removal and rebuilding with heavier beams of about 7600 square feet of roof, 2200 square feet of which was under the east wing of the Relief Station. This rebuilding of the roof was done in sections and at times best suited to the subway car service and the overhead street traffic. The easterly wing of the Relief Station had been supported on needle beams, resting on the subway roof since the construction of Section 11, as described on Page 36 of the Thirteenth Annual Report.



HELIOTYPE CO., BOSTON.

PLATFORM OF ESSEX STATION OF THE WASHINGTON STREET TUNNEL, LOOKING NORTH.



HELIOTYPE CO., BOSTON.

PLATFORM OF WINTER STATION OF THE WASHINGTON-STREET TUNNEL, LOOKING SOUTH.

This plate shows a typical arrangement of the tiled walls and ceilings of the Borlston, Essex, Winter and Summer stations. At the floor is a curved "hospital" base of green ceramic tile, and between this and the patterned border the walls are covered with white enameled tile in which advertising panels are set at intervals of from 10 to 20 feet. Part of the ceiling and the wall above the border are coated with white ceramic tiles. Wherever practicable corners at all stations are rounded and dust collecting ledges are avoided. The lighting is from 16 candle power incandescent lamps, placed at the crown of alternate arches over the middle and edge of the platform.



HELIOTYPE CO., BOSTON.

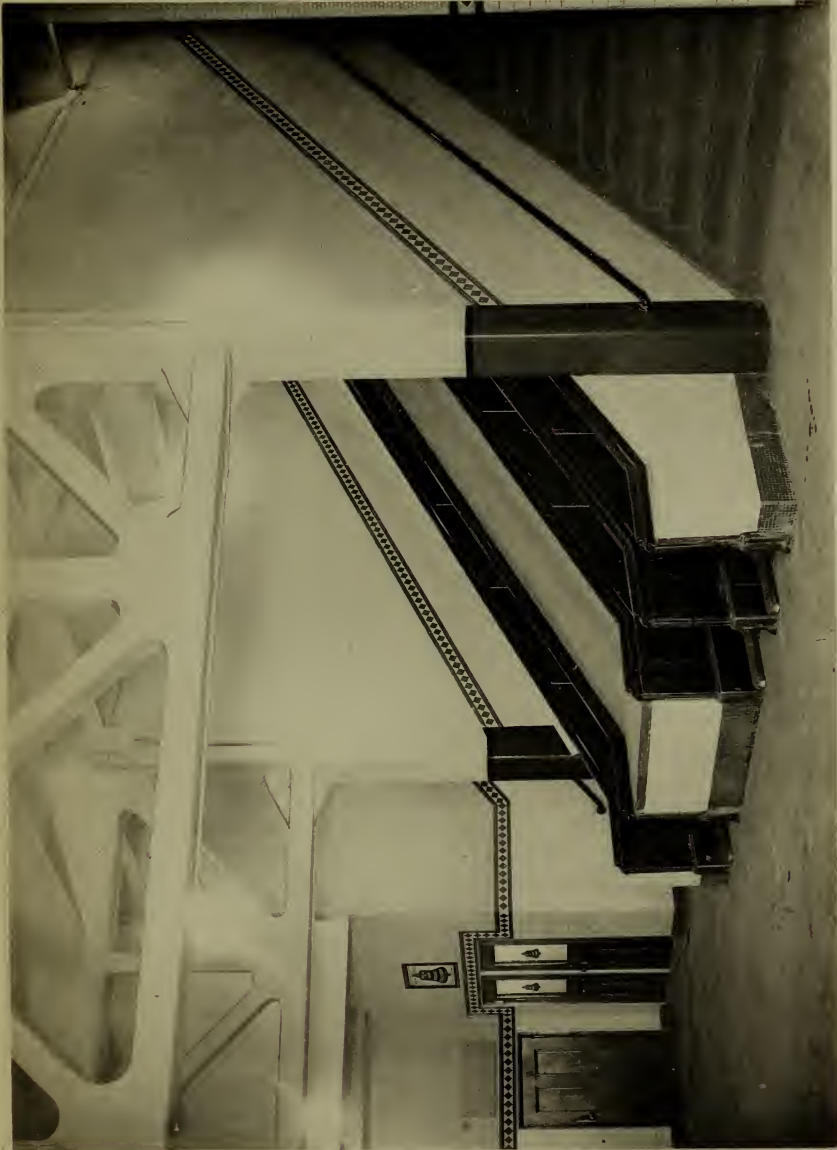
LOOKING NORTH FROM PLATFORM OF THE WASHINGTON STREET TUNNEL, WITH SUMMER STATION ON THE RIGHT
AND MILK STATION IN THE DISTANCE.



HELIOTYPE CO., BOSTON.

PLATFORM OF MILK STATION OF THE WASHINGTON-STREET TUNNEL, LOOKING SOUTH.

The north-bound track here passes beneath the station platform. Beyond the clock a flat suspended ceiling at the level of the tie rods forms the bottom of the ventilation duct. The ceilings of the station, except at the entrance stairways, are not tiled, but are made of smooth Portland cement whitened with Koat-o-Stone. All of the structural steel throughout the tunnel, including columns and tie rods, has been encased in cement to prevent rusting. The encased tie rods and columns are shown in this plate.



HELIOTYPE CO., BOSTON.

PLATFORM LEVEL, STATE STATION OF THE WASHINGTON-STREET TUNNEL.

This plate shows the southerly in and out stairways to the street and to the East Boston Tunnel, including the single descending and the double ascending inclined elevators mentioned on page 33 of the text. These elevators carry passengers a vertical distance of 20 feet, between this platform and a lobby 10.5 feet below the surface of State street south.

For matter in text relating to this plate,
see page 31.

Heavy timbers and jacks, resting on the subway invert, were placed under these needle beams while the subway roof was being removed and replaced. The load was then transferred to the new roof by means of iron plates and wedges placed between the sills of the hospital and the new roof beams.

The subpassageway construction was pushed forward while the other work was going on, in open trenches excavated from the Subway invert and in short tunnels beneath the east Subway wall and center columns. The north-bound cars were carried over the excavation on a timber trestle while this work was going on.

Rust.—The question as to whether steel used in the Subway will deteriorate by the formation of rust is an important one and the assistant in charge of the alteration of the station was directed to observe with great care all steel removed or exposed. About 200 columns, 70 beams and 150 knee-braces were removed and portions of numerous other steel members were exposed. Practically all of this steel was found to be substantially free from rust. Some rust was found on the bottom of a considerable number of rather large ($\frac{3}{4}$ " x 21" x 24") base plates of columns. The rust was generally thin but had local swellings, some of which were nearly a quarter of an inch thick. It is presumed that the rust was caused or permitted by a slight settling or shrinking away of some of the finer portions of the concrete under said plates leaving the latter resting on the coarser portions. The smaller base plates were practically free from rust.

Percentage Contract.—On account of the extreme complexity of the situation, and owing to the difficulty of doing the work incident to the enlargement and changes without interfering with the constant movement of the cars, it was thought best to make a contract for most of the work on a percentage basis rather than in the usual form, the work being done under the general direction of the Engineering Department. This arrangement permitted the plan of operations to be changed at any time, as might be found expedient, while such changes, if made under the ordinary form of contract, would be likely to result in claims for damages.

The tools were furnished and the work done by the Hugh Nawn Contracting Co., which received an addition of 15 per cent. on the cost of labor but was required to insure against

accidents to workmen and the general public. In this, as in other contracts of the same form made by the Transit Commission, it was provided that the contractor should submit satisfactory information as to the amounts paid to the men, and to this end the time sheets and pay envelopes were carefully examined and verified by a representative of the Commission. The contract could be terminated on twenty-four hours notice at any time.

All shoring and supporting of the roof and street and of the City Hospital was done for the contractor by Isaac Blair & Co. This firm also placed most of the new steel members in position.

The general work was carried on nights as well as days, with an average force of 150 men days and 100 nights; and was completed so that the whole structure was used in its permanent form May 23, 1909.

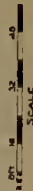
FILLING AND GRADING THE SUBWAY NORTH OF PLEASANT STREET, BETWEEN TREMONT STREET AND SHAWMUT AVENUE, TO RESTORE THE ORIGINAL INCLINE FOR THE USE OF SURFACE CARS.

The restoring of the surface cars to the Tremont-street Subway, as required by law, made it necessary to fill in for open tracks in the area bounded by Pleasant street, Shawmut avenue and Tremont street, in order to provide an incline connecting the Subway and the surface of these streets. For this purpose the Commission obtained about 2200 cu. yds. of earth (mostly gravel from streets then being resurfaced) and stored it on the banks at each side of the track space.

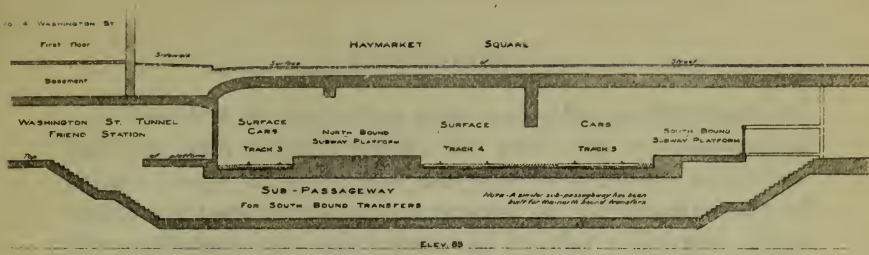
The elevated trains having ceased running through the Subway at midnight Saturday, Nov. 28, 1908, the Elevated Company proceeded to remove the tracks, the wooden platform and the shelter over the platform. The Contractor for the Commission, the Coughlan & Sheils Co., began Monday at 7 A. M. to place the filling, working continuously until completion, Wednesday noon. The Company, in the meantime, began laying its tracks on the filling so that, by Friday morning, Dec. 4, the surface cars were running into and out of the Subway from both Tremont street and Shawmut avenue.

PLAN SHOWING HAYMARKET SQUARE SUBWAY STATION ENLARGED AND SUBPASSAGEWAY CONNECTING WITH UNION FRIEND STATION OF THE WASHINGTON ST. TUNNEL TO PROVIDE FOR EXTENSIVE TRANSFERS BETWEEN THE STATIONS

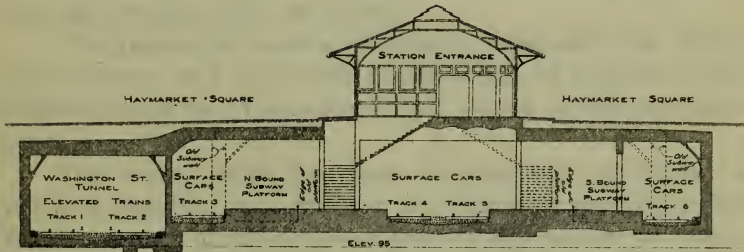
H. A. CARSON, Chief Engineer.



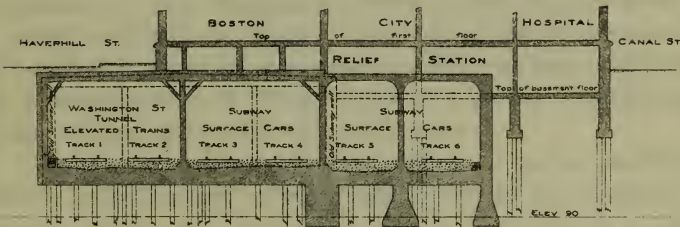
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SECTION ON LINE A-A



SECTION ON LINE B-B

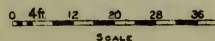


SECTION ON LINE C-C

NOTE: Old Subway walls, columns and roof and the Relief Station basement floor and foundation shown by dotted lines were removed.



CROSS SECTIONS THROUGH STATION AT HAYMARKET SQUARE



H.A. CARSON Chief Engineer



SECTION LINE A-B



SECTION LINE C-D



SECTION LINE E-F



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HONG KONG

PIPE CHANGES.

The work of re-locating pipes and other underground objects has been confined, during the past year, to Haymarket square, where the water and gas pipes and sewers which had previously been re-located on account of the construction of the old Subway were again removed in order to provide for its enlargement in Haymarket square. Owing to the restricted space available in Washington street at Haymarket square, it was necessary to make use of a relatively thin construction for the Subway roof in order to provide sufficient space in which the pipes might safely be placed.

The Appendices include a summary statement of all of the pipes, sewers, and the electric conduits laid on account of the construction of the Washington-street tunnel, in this and prior years.

This work, which has been fragmentarily described in previous reports, has consisted of re-locating practically the entire net work of sub-surface objects in that portion of Washington street where the tunnel is placed, and has also included the laying of large sewers and water pipes in side streets in order to avoid siphons under the tunnel and also for the safety of the work during construction. Notwithstanding the encroachment of the Washington-street Tunnel on the area of the street available for pipes, it has been possible to re-locate them with the increased sizes demanded by modern conditions and a consideration of future needs, in a manner satisfactory to their owners and to the city authorities.

The area available for future pipes is of course much restricted, and at several street corners, such as the junction of Summer, Winter and Washington streets, the tunnel is so high that future pipes of 16" in diameter or over, or large conduits for electric cables, steam pipes, etc., if such are required, will have to be placed beneath the tunnel. The traveling public would be compelled to continually climb extra stairs at the stations if the tunnel had been lowered for the benefit of future underground objects.

EAST BOSTON TUNNEL.

EAST BOSTON TUNNEL CONNECTION AT SCOLLAY SQUARE WITH
THE SUBWAY.

As stated on page 9 of the Commission's report, it was the intention when elevated train service should be withdrawn from the Subway, on the opening of the Washington-street Tunnel, to make a connection between the tracks of the Subway and those of the East Boston Tunnel. Plans for this connection were made which would allow sufficient clearances for the large cars of the Boston & Worcester Street Railway. Most of the steel required for this purpose is now on hand.

LEAKAGE — INJURY AND REPAIRS TO THE AIR DUCT.

The leakage in the East Boston Tunnel, nearly a mile and a half in length, was according to measurements in January, 1904, about 8 gallons a minute; a year later about 7 gallons a minute; and was found May 12, 1909, to be a little less than 6 gallons a minute. Comparing this with other subaqueous tunnels of like size the result — as far as pumping is concerned — is very satisfactory. To lessen the leakage there has been forced into shrinkage cracks and relatively porous parts of the tunnel arch about 50 cubic yards of grout. A considerable part of the leakage comes from the shore ends of the tunnel. The water in the pump-well is only about one-ninth as salt as sea-water.

A portion of the leakage, coming from the upper arch, particularly on the East Boston side, has caused the metal reinforcement of the air duct to rust badly in large and small patches in numerous places. This duct is formed by a curved diaphragm, only an inch thick, suspended from the upper arch, as is shown by Plates 8 and 9 in the Tenth Annual Report. The concrete itself in the duct, where the rusting of metal occurred, was in general dense and hard, although some softened patches were found. About 300 feet of the duct is being replaced, and a portion of the remainder will as a matter of prudence be given additional support by small suspending rods passing transversely under it and anchored into the arch on the sides.

BEACON HILL TUNNEL.

During the past year detail plans and specifications have been prepared for the construction of Section 1 of this tunnel. This Section includes the portion of the tunnel from the incline, near the intersection of Phillips and Grove streets, to a point about two hundred feet within the Common. The specifications require that most of the tunnel shall be constructed by means of a shield, unless the contractor wishes to substitute some other equally good method which shall be satisfactory to the Engineer. The probabilities are that most or all of the work will be done in free air, but the bids include alternative unit prices for work done under compressed air, as it may be found desirable to use it for a portion of the work. The portion of Section 1 which is under the Common is to be worked entirely from a shaft or shafts to the west thereof, no disturbance or occupation of the surface of the Common being allowed. The specified time for the completion of Section 1 is Nov. 1, 1910.

During January, February and March, 1909, some preliminary work was done on the Beacon Hill Tunnel by day labor, for the purpose of determining, more definitely than could be done by means of borings, the nature of the ground through which the tunnel was to run. A shaft was first excavated to grade on the line of the tunnel at the intersection of Phillips and Grove streets. A timbered drift was then run from this shaft in a southeasterly direction on the line of the tunnel a distance of about 400 ft. The drift was about $8 \times 8\frac{1}{2}$ ft. in cross-section and was located at the bottom of the proposed northerly wall of the tunnel, where it would later serve as one of the side-wall drifts, assuming that this portion of the tunnel would be built by means of a roof shield. The earth, as far as the excavation went, was found to be a very hard and almost impervious mixture of sandy clay with coarse gravel and occasional boulders, and well suited to ordinary tunneling operations. The information thus obtained aided in determining various details in the design of the tunnel before contracting for the main portion of the work, and also enabled contractors bidding on the work to obtain a better idea of the character of the excavation.

On March 30, 1909, bids for the construction of Section 1 were received and opened. (See Appendices CC and DD.)

On April 8, 1909, notice was served on the Commission of a hearing to restrain the Commission from proceeding with the work of constructing the tunnel as planned. The work has in consequence been discontinued since that date, except for necessary pumping to keep water out of the preliminary shaft and drift.

ASSISTANTS IN THE ENGINEERING DEPARTMENT.

Appendix G gives the names of those employed in the Engineering Department for more than a month during the past year. I desire to express my thanks for their loyal and effective service and for their valuable suggestions.

CONCLUSION.

In submitting to the Transit Commission my last report as Chief Engineer, I wish to express for its members, past and present, my utmost gratitude, esteem and respect.

H. A. CARSON,

Chief Engineer.

APPENDIX A.

[CHAPTER 455.]

AN ACT RELATIVE TO THE BOSTON TRANSIT COMMISSION.

Be it enacted, etc., as follows:

SECTION 1. The term of office of the Boston transit commission and of the members thereof is hereby extended for two years from the first day of July in the year nineteen hundred and nine. The powers, duties and compensation of the members of said commission during said extended term shall remain the same as specified in chapter five hundred and forty-eight of the acts of the year eighteen hundred and ninety-four and acts in amendment thereof and in addition thereto. Any vacancy in said commission shall be filled in the manner provided in said chapter five hundred and forty-eight.

SECTION 2. This act shall take effect upon its passage. [*Approved, May 27, 1909.*]

APPENDIX B.

BOSTON AND EASTERN ELECTRIC RAILROAD COMPANY.

BOSTON, MASS., May 10, 1909.

To the Honorable Senate and the House of Representatives.

The following order was transmitted by the General Court on April 6, 1909:—

"*Ordered*, That the Board of Railroad Commissioners and the Boston Transit Commission, sitting jointly, be requested to investigate and report to the General Court, on or before the last day of April, whether or not it is advisable, in their opinion, to grant the petition for legislation to authorize the Boston and Eastern Electric Railroad Company to construct a tunnel under Boston harbor, and to connect the same with terminals and with the tracks of other companies, substantially in the manner set forth in the bill attached hereto, and under what restrictions, if any, such authority should be granted."

Upon the receipt of this order the members of the Joint Board so constituted met forthwith and organized by choosing as its chairman the chairman of the Board of Railroad Commissioners. A public hearing was given after advertised notice at the rooms of the Railroad Commissioners on April 14. Since that date the Joint Board has devoted a great deal of time to the consideration of the subject referred to it, and has had many conferences with counsel for the petitioners and also with counsel for various other interests, including the city of Boston, who desired to be heard in opposition to the petition and the proposed bill. Finding it impossible to finish its work by April 30, the Joint Board on that date addressed a communication to the General Court requesting that the time allowed for making its report be extended to May 10, and since the making of such request it has given much additional time to the study of the subject in its many aspects.

The Joint Board has further thought it proper to take note of certain legislative action subsequent to the date of the above order. On April 9 the Committee on Metropolitan Affairs reported to the Legislature a resolve (House Document 1545) providing for an investigation by this same Joint Board "as to the desirability of constructing additional subways, tunnels and elevated structures in the city of Boston." This resolve requests the Joint Board "to investigate and report to the General Court on or before the second Saturday of January, 1910, whether or not in their opinion it is advisable, expedient and in the public interest to grant any or all" of certain petitions for legislation, twelve in number, specifically referred to with their respective accompanying bills. All of said petitions relate to proposed new subways or tunnels, or the use of existing subways or tunnels, in the city of Boston. One of them calls for an investigation "into the subject of the necessity and the cost of construction of a tunnel or subway between the city of Boston and the city of Chelsea." By the terms of this resolve as now amended the Joint Board is requested to report "under what conditions and restrictions, if any, and in what form such petitions should be granted." This resolve has now been passed to be engrossed by both branches of the Legislature, but a minor Senate amendment has not yet reached the House for concurrence.

On April 15 the Committee on Metropolitan Affairs reported a resolve (Senate Document 309) instructing "the members of the Board of Railroad

Commissioners, the Board of Harbor and Land Commissioners, the Boston Transit Commission and the Metropolitan Park Commission to sit together as a joint board for the purposes specified in chapter 108 of the resolves of the year 1907," and referring to such Joint Board for its consideration the report of the Metropolitan Improvement Commission transmitted to the General Court under the terms of the above mentioned resolve. By the terms of this pending resolve the Joint Board so constituted is instructed to make a preliminary report to the General Court on or before the first day of January, 1910, "informing the General Court whether or not any immediate action by it is necessary or desirable." This resolve has been passed by the Senate and is now before the Committee on Ways and Means of the House of Representatives.

On April 21 the Committee on Street Railways reported a resolve (Senate Document 320) providing for an investigation by the Board of Railroad Commissioners and the Boston Transit Commission sitting jointly of certain financial and corporate questions relating particularly to the Boston Elevated Railway Company but having an important bearing upon the whole question of passenger transportation within the metropolitan district, and also providing for an inquiry as to whether said company should be authorized to extend its elevated railway to the city of Medford. This resolve has now been passed to be engrossed by both branches of the Legislature and has also been enacted by the House of Representatives.

Assuming, as it feels warranted in doing, that the resolves above referred to are likely to be finally passed, and with such knowledge as it now possesses of the matters which would thus be referred to it and of the reasons which led the above-named committees to report these resolves, and have thus far led the General Court to take favorable action upon them, this Joint Board concludes that a new legislative policy is in process of adoption, apparently without serious opposition, with respect not only to the construction of tunnels and subways within the city of Boston but to the whole question of metropolitan transportation. This policy seems to be that of making better provision than in the past for the preliminary study of special transportation projects with reference to the best present and future development of the transportation system as a whole. The members of the Joint Board deem it proper to state that in their opinion the adoption of such a policy would be in the public interest.

In view of the above facts and considerations and believing that action at the present time upon the petition and bill of the Boston & Eastern Electric Railroad Company would not be in conformity with the policy above referred to and might prejudice the fair consideration of some proposal or subject included within the aforesaid references the Joint Board now reports its conclusion that it is not advisable at this time to pass the bill accompanying the petition or any substitute therefor containing further restrictions.

If, however, the resolves above referred to should not finally be adopted, or if the conclusion reached in this report should not be approved by the General Court and it should desire that a bill containing all proper restrictions and safeguards should be submitted to at the present session, this Joint Board will endeavor to comply promptly with any such request.

The Joint Board distinctly recognizes the sole authority vested by law in the Board of Railroad Commissioners to decide the question whether public convenience and necessity require the construction of an electric railroad under the general electric railroad law and the conclusion above stated is not deemed to be inconsistent with any past action or to prejudice any future action of the Board of Railroad Commissioners under the general law.

The above report is unanimously submitted.

For the Joint Board,

W. P. HALL,
Chairman.

APPENDIX C.

[CHAPTER 94.]

RESOLVE TO PROVIDE FOR AN INVESTIGATION AS TO THE ADVISABILITY OF
CONSTRUCTING ADDITIONAL SUBWAYS, TUNNELS AND ELEVATED STRUCT-
URES IN THE CITY OF BOSTON.

Resolved, That the board of railroad commissioners and the Boston transit commission, sitting jointly, be requested to investigate and report to the general court on or before the second Saturday of January, nineteen hundred and ten, whether or not, in their opinion, it is advisable, expedient and for the public interest, to grant any or all of the following petitions for legislation, namely: petition of Charles A. Ufford, with accompanying bill, No. 1288; petition of Thomas H. Dowd, with accompanying bill, No. 1247; petition of Michael J. Reidy, with accompanying bill, No. 1030; petition of Harry H. Ham, with accompanying bill, No. 1028; petition of Pierce J. Grace, with accompanying bill, No. 1026; petition of Malcolm E. Nichols, with accompanying bill, No. 659; petition of Pierce J. Grace, with accompanying bill, No. 1025; petition of Houghton and Dutton, with accompanying bill, No. 653; petition of William M. Robinson, with accompanying bill, No. 520; petition of Edward P. Barry, with accompanying bill, No. 339; petition of John J. Hayes, with accompanying bill, No. 196; petition of William J. Paul, with accompanying bill, No. 236; and under what conditions and restrictions, if any, and in what form such petitions should be granted, and if any legislation is recommended said joint board is requested to submit with its report a draft of an act or acts embodying the legislation recommended. [*Approved May 19, 1909.*]

APPENDIX D.

[CHAPTER 110.]

RESOLVE TO PROVIDE FOR AN INVESTIGATION AS TO THE ADVISABILITY OF AUTHORIZING THE BOSTON AND EASTERN ELECTRIC RAILROAD COMPANY TO CONSTRUCT A TUNNEL AND SUBWAYS IN THE CITY OF BOSTON.

Resolved, That the board of railroad commissioners and the Boston transit commission, sitting jointly, is hereby requested to investigate and report to the general court on or before the second Saturday of January, nineteen hundred and ten, whether or not, in their opinion, it is advisable, expedient and in the public interest to grant the following petition for legislation, namely: the petition of Melville Woodbury and others with accompanying bill, House, No. 1094, and under what conditions and restrictions, if any, and in what form said petition should be granted; and, if any legislation is recommended by said joint board, the board is requested to submit with its report a draft of an act or acts embodying the same. [*Approved May 24, 1909.*]

APPENDIX E.

[CHAPTER 85.]

RESOLVE TO PROVIDE FOR AN INVESTIGATION AND REPORT BY THE BOARD OF RAILROAD COMMISSIONERS AND THE BOSTON TRANSIT COMMISSION, SITTING JOINTLY, AS TO CERTAIN MATTERS RELATIVE TO THE WEST END STREET RAILWAY COMPANY AND THE BOSTON ELEVATED RAILWAY COMPANY.

Resolved, That the board of railroad commissioners and the Boston transit commission, sitting jointly, be requested to investigate and report to the general court on or before the second Saturday of January, nineteen hundred and ten, whether or not in their opinion it is advisable, expedient, and in the public interest:—

(First.) To amend chapter five hundred and fifty-one of the acts of the year nineteen hundred and eight by providing for a distribution of any of the assets of the West End Street Railway Company among its stockholders, or by changing the terms and conditions of the first and second preferred stock to be issued by the Boston Elevated Railway Company, and if so, in what manner and to what extent;

(Second.) To authorize the Boston Elevated Railway Company to acquire and hold the stock and securities of other street railway companies, elevated railroads or electric railroads, and if so, under what conditions and limitations;

(Third.) To authorize the Boston Elevated Railway Company to extend its elevated railroad from Sullivan square to the city of Medford, and if so, under what conditions and limitations. [*Approved May 14, 1909.*]

APPENDIX F.

[CHAPTER 113.]

RESOLVE TO PROVIDE FOR AN INVESTIGATION AND REPORT RELATIVE TO
PUBLIC IMPROVEMENTS FOR THE METROPOLITAN DISTRICT.

Resolved, That the members of the board of railroad commissioners, the board of harbor and land commissioners, the Boston transit commission and the metropolitan park commission are hereby instructed to sit together as a joint board for the purposes specified in chapter one hundred and eight of the resolves of the year nineteen hundred and seven, and the report transmitted to the general court under the terms of said resolve is referred to said joint board for its consideration. The members of the joint board shall serve without compensation other than their official salaries, but the joint board may expend such sums of money as may be approved by the governor and council, and the expenses so incurred shall be assessed upon the metropolitan parks district. Reports may be made by the joint board to the general court from time to time. A preliminary report shall be made to the general court on or before the first day of January, nineteen hundred and ten, informing the general court whether or not any immediate action by it is necessary or desirable, and if any action or legislation is recommended, a bill or bills shall be submitted embodying such recommendations. A final report shall be made by the joint board to the general court on or before the first day of January, nineteen hundred and eleven, said report to be accompanied by a bill or bills embodying any further recommendations which may be made.
[Approved May 28, 1909.]

APPENDIX G.

The names of all the assistants in the Engineering Department who have been employed for more than one month during the last year, together with an indication of the work on which they have been engaged, are given below. Those marked * left the employ of the Commission during the year.

OFFICE ASSISTANTS, JUNE 30, 1909.

Assistant Engineers.

EDMUND S. DAVIS,	Oversight of office and field work.
WILLIAM W. LEWIS,	} Studies, preliminary estimates, designs for structures and contract plans.
LEONARD B. HOWE,	
WILBUR W. DAVIS,	Assisting on plans and making surveys for Tunnel under Beacon Hill.
GEORGE H. STEARNS,	} Designs for steel work and concrete structures.
*RUSSELL L. ELLIOT,	
*CHARLES H. BARTLETT,	
*CHAUNCEY R. PERRY,	
*JOHN S. HODGSON,	Specifications, estimates, etc.

Draftsmen, etc.

*GEORGE P. GOODMAN,	} Plans for tunnel work and structures.
ROY M. LOTHROP,	
*RUDOLPH J. THANISCH,	} Details for steel work.
EDMUND A. RICE,	
*SAMUEL C. LYMAN,	Rodman on Tiling work until Oct. 1, 1908; later in office.
*FREDERICK F. MURPHY,	Photographer and assistant for purchas- ing supplies.
FREDERIC W. STILES,	

FIELD ASSISTANTS.

Assistant Engineers.

*P. F. O'BRIEN,	Record plans, sections 1, 2, 5 and 9; mis- cellaneous work on Washington-street Tunnel.
*ROBERT B. FARWELL,	Studies and estimates for Riverbank Sub- way and Cambridge Connection.
G. DANA EMERSON,	Interior finish (handrails, gates, etc.) Washington-street Tunnel; preliminary construction work and design of struc- tures, Section 1 of Tunnel under Beacon Hill.
LAURENCE B. MANLEY,	Interior finish of stations; paving; changes of pipes, conduits, etc.

WILLIAM O. WELLINGTON,	Sub-passageway at Travers street and tunnel work under Relief Hospital; enlargement of Haymarket-square Station; changes in Subway at Pleasant street and preliminary surveys for Tunnel under Beacon Hill.
JAMES T. FRAME,	Tile work in stations and inspecting work in changes at Haymarket-square Station; record plans, sections 4 and 5, Washington-street Tunnel.
*C. LEONARD BROWN,	Inspection, interior finish, Washington-street Tunnel.
<i>Transitmen.</i>	
JAMES B. FLAWS, *RALPH C. MCPHERSON, *LEON R. VAUGHN,	} Line and grade work. Inspecting construction work under the supervision of the assistant engineer.
<i>Rodmen.</i>	
*HENRY N. HAYWARD, ARTHUR V. LYNCH, PHILIP B. WALKER,	} Line and grade work. Same as above, also on experimental work, etc.
*HYMAN LEFTOVITH, *MOSES L. BROWN, *FRANK W. BURNHAM, *FREDERIC W. FLETCHER, *JOHN J. HURLEY, FRANK H. SCHOENFUSS,	} Line and grade work; also assisting inspection on construction work under the supervision of the assistant engineer. Testing cement, pitch and other material; also superintending making of concrete sheeting, etc.
*ALFRED W. PARKER,	Inspector of steel work.

SECRETARY TO CHIEF ENGINEER, STENOGRAPHERS, ETC.

ARTHUR B. CARTER,	Secretary and Executive Clerk to the Chief Engineer.
ROSE A. McMAHON,	Stenographer.
JOHN E. RYAN,	Stenographer.
*DAVID J. DONAHUE,	Messenger and Stenographer.
JOSEPH P. SHEERIN,	Messenger and Stenographer.
*MICHAEL J. PENDERGAST,	Messenger and Stenographer.
CHARLES E. FAY,	Messenger in draughting-room; blue-printing; care of plans.

APPENDIX H.

SUMMARY STATEMENT OF ALL OF THE PIPES, SEWERS AND ELECTRIC
CONDUITS LAID ON ACCOUNT OF THE CONSTRUCTION OF THE WASH-
INGTON STREET TUNNEL, IN THIS AND PRIOR YEARS.

WASHINGTON STREET TUNNEL.

Sewers built on account of the construction of the Washington street Tunnel.

Size.	Length, Feet.	Shape.	Material.
5'-6"x4'-11"	18	Bellmouth	Reinforced concrete.
5'-3"x3'-6"	717	Egg	Brick and concrete.
"	888	"	Brick.
4'-6"	385	Circle	Brick and concrete.
4'-3"	51	"	Brick.
"	157	"	" and concrete.
4'-3"x2'-10"	196	Egg	" " "
4'-0"x3'-0"	37	Rectangle	Brick and reinforced concrete.
4'-0"x2'-8"	524	Egg	Concrete.
3'-9"x2'-6"	379	"	Brick and concrete.
"	91	"	Concrete.
3'-6"	1,042	Circle	Brick and concrete.
"	90	"	Brick.
"	54	"	Concrete.
3'-6"x2'-4"	436	Egg	Brick and concrete.
"	460	"	Concrete.
3'-6"x1'-3"	148	Oval	"
3'-4"x1'-6"	48	"	Reinforced concrete.
*3'-3"x1'-8"	29	Ellipse	" "
3'-0"x3'-0"	54	Horse-shoe	Concrete.
3'-0"	381	Circle	Brick and concrete.
"	527	"	Concrete.
3'-0"x2'-0"	135	Egg	"
2'-9"x1'-6"	69	Oval	Reinforced concrete.
2'-6"x1'-8"	21	Egg	Concrete.
28"	18	Circle	"
27"	32	Circle	Reinforced concrete.
24"	2,149	—	Vitrified pipe in concrete.
20"	339	—	" " " "
18"	1,570	—	" " " "
15"	2,266	—	" " " "
12"	1,549	—	" " " "
10"	40	—	" " " "
6"	46	—	" " " "
6"	54	—	Cast iron pipe in concrete.
Total,	15,000		

* Double barrel.

WASHINGTON STREET TUNNEL.—*Continued.*

Water Mains laid on account of the construction of the Washington street Tunnel.

Size, Inches.	Length, Feet.	Size, Inches.	Length, Feet.
36	2,988	12	3,443
30	1,018	10	10
24	2,230	8	619
20	383	6	500
16	1,346		
Total, 12,537			

Water Mains laid at the expense of the Water Department in connection with the construction of the Washington street Tunnel.

Size, Inches.	Length, Feet.	Size, Inches.	Length, Feet.
36	50	10	113
16	1,818	8	40
12	1,489	6	23
Total, 3,533			

The Edison Electric Illuminating Company's conduits laid on account of the construction of the Washington street Tunnel.

This work was done by and at the expense of the Edison Company and only very approximate lengths are given.

The length of conduit given is from center to center of the manholes.

No. of Ducts.	Conduit Linear Feet.	Duct Feet.	No. of Ducts.	Conduit Linear Feet.	Duct Feet.
30	21	630	12	596	7,152
25	29	725	10	323	3,230
24	1,485	35,640	8	919	7,352
21	462	9,702	7	50	350
20	1,456	29,120	6	915	5,490
18	154	2,772	4	250	1,000
14	447	6,258	3	193	579
Total, 7,300 110,000					

WASHINGTON STREET TUNNEL.—*Continued.*

The New England Telephone and Telegraph Company's conduits laid on account of the construction of the Washington street Tunnel.

This work was done by and at the expense of the Telephone Company and only very approximate lengths are given.

The length of conduit given is from center to center of manholes.

No. of Ducts.	Conduit Linear Feet.	Duct Feet.	No. of Ducts.	Conduit Linear Feet.	Duct Feet.
32	155	4,960	14	39	546
24	318	7,632	12	1,188	14,256
23	38	874	10	608	6,080
21	368	7,728	8	1,852	14,816
20	43	860	6	436	2,616
18	16	288	4	196	784
16	338	5,408	2	76	152
Total, 5,671					67,000

Gas Mains laid on account of the construction of the Washington street Tunnel.

This work was done by and at the expense of the Boston Consolidated Gas Company and only the approximate lengths are given.

Size, Inches.	Length, Feet.	Size, Inches.	Length, Feet.
20	3,944	8	232
18	804	6	2,387
12	4,951	4	152
10	27	3	36
Total, 12,533			

WASHINGTON STREET TUNNEL.—*Continued.*

Electric conduits laid on account of the construction of the Washington street Tunnel.

The work was done by and at the expense of the various companies and only very approximate lengths are given.

The length of conduit given is from center to center of manholes.

	No. of Ducts.	Conduit Linear Feet.	Duct Feet.	
Boston Low Tension Wire Ass'n . . .	2	496	992	
	6	538	2,728	
	7	196	1,372	
	9	36	324	
Total,		1,266	5,416	
Boston Pneumatic Transit Co.	2	110	220	10" dia. pipe.
	2	146	292	8" " "
	1	—	2,270	2½" " "
Boston Elevated Railway Co.	5	120	600	
	9	27	243	
Total,		147	843	
Western Union Telegraph Co.	1	250	250	
	3	97	291	
Total,		347	541	
Postal Tel. and Cable Co.	2	192	384	

APPENDIX I.

WASHINGTON STREET TUNNEL.—CANVASS OF BIDS FOR BUILDING A PORTION OF THE WALLS, ROOF AND INVERT FOR THE ENLARGEMENT OF THE SUBWAY UNDER THE BOSTON CITY HOSPITAL RELIEF STATION.—
BIDS OPENED JULY 16, 1908.

BIDDERS AND ADDRESSES.	550 cubic yards earth excavation.	Cutting out, removing and disposing of 400 cu. yds. of masonry, consisting of basement floors, walls, foundations, etc.	Cutting out, removing and disposing of 130 cu. yds. of concrete masonry of the Subway structure.	Removing and disposing of 10 cu. yds. of old canal wall, and boulders, met in excavation.	Furnishing, hauling and putting in place 750 cu. yds. Portland concrete.	Setting in place and securing 18 tons of steel reinforcing rods.	Setting in place and securing 35 tons of steel and iron weighing 6 pounds or more per linear foot.	Furnishing, preparing and applying 500 sq. yds. of coating, or skin, or Portland cement mortar, $\frac{1}{4}$ inch thick.	Furnishing, preparing and applying 300 sq. yds. of waterproof coating, $\frac{1}{4}$ inch thick, of pitch.	Preparing and applying 2,500 sq. yds. of tarred felt, pitch, etc., in layers.	Applying 85 sq. yds. of crude paraffin or other preparation to heads of piles in place.	2,000 lin. ft. of spruce piles driven, stripped where coming in contact with masonry, and cut off.	Cutting off 260 spruce piles now in place and stripping where coming in contact with masonry.	Supporting and protecting Relief Station; riveting hospital columns to girders; cutting, pinning up; and all work and risks, etc., etc.	TOTALS.	TIME NAMED FOR COMPLETION
	a	b	bb	3b	c2-4	f	ff	g	h	i	l	s	ss	k		
Falvey & Kelly, 15 Intervale Park, Dorchester...	\$4.00 2,200.00	\$8.00 3,200.00	\$14.00 1,820.00	\$6.00 60.00	\$12.50 9,375.00	\$20.00 360.00	\$20.00 700.00	\$10.60 300.00	\$0.50 150.00	\$0.20 500.00	\$1.00 \$5.00	\$0.70 1,400.00	\$0.70 182.00	\$1,600.00	\$21,932.00	Oct. 15, 1908
John E. Palmer, 1012 Old South Bldg., Boston....	4.60 2,530.00	7.50 3,000.00	15.00 1,950.00	10.00 100.00	14.00 10,500.00	12.00 216.00	16.00 560.00	.50 250.00	.20 60.00	.20 500.00	.40 34.00	.35 700.00	.30 78.00	1,000.00	21,478.00	Oct. 15, 1908.
Coughlan & Sheils Co., 43 Tremont St., Boston.....	2.25 1,237.50	7.50 3,000.00	17.00 2,210.00	20.00 200.00	15.00 11,250.00	10.00 180.00	20.00 700.00	.40 200.00	.20 60.00	.20 500.00	.15 12.75	.30 600.00	.20 52.00	800.00	21,002.25	Sept. 1, '08, day & night. Oct. 1, '08, days only.
Hugh Nawn Contracting Co., 82 Savin St., Roxbury.....	4.00 2,200.00	8.00 3,200.00	12.00 1,560.00	6.00 60.00	11.00 8,250.00	12.00 216.00	15.00 525.00	.50 250.00	.50 150.00	.20 500.00	.10 8.50	.40 800.00	.25 65.00	650.00	18,434.50	Sept. 28, 1908.
Coleman Bros., 15 Court Square, Boston.....	4.00 2,200.00	5.00 2,000.00	12.00 1,560.00	10.00 100.00	10.00 7,500.00	15.00 270.00	20.00 700.00	.50 250.00	.75 225.00	.25 625.00	.80 68.00	.25 500.00	.20 52.00	1,000.00	17,050.00	Oct. 1, 1908.

NOTE.—The contract was awarded to Coleman Bros.

APPENDIX J.

CAMBRIDGE CONNECTION.—CANVASS OF BIDS FOR THREE TEST-BORINGS
ON LINE OF TUNNEL UNDER BEACON HILL.—BIDS OPENED JULY
16, 1908.

BIDDERS AND ADDRESSES.	Three Borings, aggregating 245 linear feet, made with pipes not exceeding 6 ins. inside diameter. Price to cover taking of samples in all materials.	
Chas. R. Gow Co., 79 Milk Street, Boston.....	Price per lin. ft., Amount,	\$3.65 894.25
Healey Sewer Machine & Constrn. Co., 15 Beacon Street, Boston.....	Price per lin. ft., Amount,	3.25 796.25

NOTE.—The contract was awarded to Healey Sewer Machine & Construc-
tion Co.

APPENDIX K.

WASHINGTON STREET TUNNEL. — CANVASS OF BIDS FOR FURNISHING AND INSTALLING ABOUT 660 LIN. FT. OF OAK HAND-RAILS, INCLUDING METAL FITTINGS, IN THE TEMPLE PLACE, WINTER STREET, SUMMER STREET, FRANKLIN STREET AND ESSEX STREET ENTRANCES.—BIDS OPENED JULY 28, 1908.

BIDDERS AND ADDRESSES.	Lump Price.	TIME NAMED FOR COMPLETION.
Charles H. Belledeu, 35 Wareham Street, Boston.....	\$1,099.00	
John Y. Mainland, 414 Albany Street, Boston.....	988.00	
A. Dickey & Co., 37 Bristol Street, Boston.....	885.50	
Isaac McLean Sons Co., 31 Lancaster Street, Boston.....	761.00	Ten days.

NOTE.—The contract was awarded to Isaac McLean Sons Co.

APPENDIX L.

WASHINGTON STREET TUNNEL.—CANVASS OF BIDS FOR FURNISHING
AND ERECTING BOSTWICK GATES AT ENTRANCES AND EXITS.—
BIDS OPENED AUG. 4, 1908.

BIDDERS AND ADDRESSES.	Lump Bid. Gates with Fittings (not including Locks), painted, as shown on Plans Nos. 9041 to 9054, inclusive.	TIME NAMED FOR COMPLETION.
Wright Wire Co., Worcester, Mass.	\$1,685.00	6 weeks or less.
L. M. Ham & Co., 150 Portland St., Boston.	1,523.00	About 3 months.
Chelmsford Foundry Co., Medford, Mass.	1,453.00	4 weeks.
The Morss & Whyte Co., 75 Cornhill, Boston.	1,450.00	75 days.
A. B. Robbins Iron Co., Norfolk Downs, Mass.	1,192.00	6 weeks.
Oliver Whyte & Co., 17 Cornhill, Boston.	1,087.00	About 4 weeks.

NOTE.—The contract was awarded to Oliver Whyte & Co.

APPENDIX M.

WASHINGTON STREET TUNNEL.—CANVASS OF BIDS FOR FURNISHING AND INSTALLING ABOUT 790 LIN. FT. OF OAK HAND-RAILS, INCLUDING METAL FITTINGS, IN THE LA GRANGE STREET, BOYLSTON STREET, HAYWARD PLACE, MILK STREET, WATER STREET AND ADAMS SQUARE ENTRANCES.—BIDS OPENED AUGUST 6, 1908.

BIDDERS AND ADDRESSES.	Lump Price.	TIME NAMED FOR COMPLETION.
Charles H. Belledue, 35 Wareham Street, Boston.....	\$1,305.00	
John Y. Mainland, 414 Albany Street, Boston.....	1,290.00	
A. Dickey & Co., 37 Bristol Street, Boston	1,030.00	
Isaac McLean Sons Co., 31 Lancaster Street, Boston.....	898.50	Two weeks.

NOTE.—The contract was awarded to Isaac McLean Sons Co.

APPENDIX N.

WASHINGTON STREET TUNNEL.—CANVASS OF BIDS FOR STEEL FENCES
AND STAIR BALUSTRADES.—BIDS OPENED AUGUST 20, 1908.

BIDDERS AND ADDRESSES.	Furnishing and installing fences and balustrades.	TIME NAMED FOR COMPLETION.
G. W. & F. Smith Iron Co., Gerard Street, Roxbury.....	\$1,474.00	Five weeks.
Oliver Whyte & Co., 17 Cornhill, Boston.....	1,396.00	Six weeks.
A. B. Robbins Iron Co., Norfolk Downs, Mass.....	1,041.00	Five weeks.

NOTE.—The contract was awarded to A. B. Robbins Iron Co.

APPENDIX O.

WASHINGTON STREET TUNNEL.—CANVASS OF BIDS FOR FURNISHING AND
ERECTING STEEL FENCES, ETC., IN MILK STATION.—BIDS OPENED
AUGUST 24, 1908.

BIDDERS AND ADDRESSES.	Lump Price for Fences, stair balus- trades, posts and frame for sign.	TIME NAMED FOR DELIVERY.
G. W. & F. Smith Iron Co., Gerard Street, Roxbury.....	\$1,100.00	Four weeks.
Oliver Whyte & Co., 17 Cornhill, Boston.....	825.00	Four weeks.
A. B. Robbins Iron Co., Norfolk Downs, Mass.....	749.00	Six weeks.
Chelmsford Foundry Co., Medford, Mass.....	647.00	Three weeks.

NOTE.—The contract was awarded to Chelmsford Foundry Co.

APPENDIX P.

WASHINGTON STREET TUNNEL.—CANVASS OF BIDS FOR TAKING UP AND RELAYING PAVEMENT, ETC., ON WINTER STREET, BETWEEN WASHINGTON STREET AND JACKSON PLACE.—BIDS OPENED AUGUST 27, 1908.

BIDDERS AND ADDRESSES.	Item (a).— Taking up blocks, cart- ing away materials and relaying 270 sq. yds. granite block pave- ment, incl. crosswalk flagging; pitch & pebble joints.	Item (b). Furnishing and putting in place 270 sq. yds. con- crete base, 6 inches thick.	TOTALS.
John T. Shea, Jr., 696 E. Sixth St., So. Boston...	\$1.25 337.50	\$1.10 297.00	634.50
Wm. J. Rafferty & Co., 200 W. Eighth St., So. Boston.	1.15 310.50	1.15 310.50	621.00
Coleman Bros., 15 Court Square, Boston.....	1.00 270.00	1.00 270.00	540.00

NOTE.—The contract was awarded to Coleman Bros.

APPENDIX Q.

WASHINGTON STREET TUNNEL.—CANVASS OF BIDS FOR FURNISHING AND
ERECTING STEEL FENCES FOR SUB-PASSAGeways, UNION-FRIEND
STATION.—BIDS OPENED SEPTEMBER 9, 1908.

BIDDERS AND ADDRESSES.	Lump Price.	TIME NAMED FOR COMPLETION.	Totals, in- cluding Prem- iums at \$20.00 per working day beyond shortest period named (Three weeks, equal to 18 working days).
Chelmsford Foundry Co., Medford.....	\$400.00	Three weeks	\$400.00
The Grecian Iron Works, 28 Tudor St., Cambridge.....	363.00	Four weeks	483.00
Oliver Whyte & Co., 17 Cornhill, Boston.....	330.00	Three weeks	330.00
A. B. Robbins Iron Co., Norfolk Downs, Quincy.....	275.00	Three weeks	275.00
L. M. Ham & Co., 150 Portland St., Boston.....	184.00	Ten weeks	1,024.00

NOTE.—The contract was awarded to A. B. Robbins Iron Co.

APPENDIX R.

WASHINGTON STREET TUNNEL.—CANVASS OF BIDS FOR FURNISHING AND
INSTALLING, IN VARIOUS STATIONS, OAK HAND-RAILS AND CAST-IRON
POSTS.—BIDS OPENED SEPTEMBER 9, 1908.

BIDDERS AND ADDRESSES.	Lump Price for about 400 lin. ft. of 2½- inch Oak hand-rails and 71 cast- iron posts.	TIME NAMED FOR COMPLETION.
Isaac McLean Sons Co., 31 Lancaster St., Boston.....	\$1,276.00	One month.
John Y. Mainland, 414 Albany St., Boston.....	1,246.00	Five weeks.
A. Dickey & Co., 37 Bristol St., Boston.....	1,150.00	Four weeks.

NOTE.—The contract was awarded to A. Dickey & Co.

APPENDIX S.

WASHINGTON STREET TUNNEL.—CANVASS OF ALTERNATIVE BIDS FOR FURNISHING AND INSTALLING SHEET METAL COVERING, WITH WHITE PINE BACKING, FOR TEN BALUSTRADE FACES OF RENO INCLINED ELEVATORS, STATE STATION.—BIDS OPENED SEPT. 17, 1908.

BIDDERS AND ADDRESSES.	Covering 10 balustrade faces with Sheet Brass, etc.	Covering one space between elevators.	TOTALS FOR BRASS.	TIME NAMED FOR COMPLETION.	Covering 10 balustrade faces with Sheet Bronze, etc.	Covering one space between elevators.	TOTALS FOR BRONZE.	TIME NAMED FOR COMPLETION.
	Item (1a).	Item (1b.)			Item (2a).	Item (2b).		
John W. Rapp, 1 Madison Ave., New York City.	\$2,250.00	\$485.00	\$2,735.00	42 days	\$2,275.00	\$495.00	\$2,770.00	45 days.
Wm. Hall & Co., 7 Dock St., Boston.....	2,061.00	323.75	2,384.75	90 days	2,247.75	379.64	2,627.39	90 days.
E. B. Badger & Sons Co., 75 Pitts St., Boston.....	1,274.00	280.00	1,550.00	On or before Nov. 6, 1908				

NOTE.—The contract was awarded to E. B. Badger & Sons Co.

APPENDIX T.

WASHINGTON STREET TUNNEL.—CANVASS OF BIDS FOR STRUCTURAL STEELWORK REQUIRED FOR PART OF THE ENLARGEMENT OF SUBWAY IN HAYMARKET SQUARE.—BIDS OPENED NOVEMBER 5, 1908.

BIDDERS AND ADDRESSES.	24,000 lbs. of structural steel.		Time named for delivery in two installments, not later than Nov. 30 and Dec. 15, 1908, respectively.	REMARKS.
	Price per pound.	Amount.	Last week in December.	
G. W. & F. Smith Co., Gerard Street, Roxbury.....	Price per pound.	\$0.04 960.00		
Chelmsford Foundry Co., Medford.....	Price per pound.	.04 960.00		
H. P. Converse & Co., 88 Broad Street, Boston.....	Price per pound.	.038 912.00		
Boston Bridge Works, 47 Winter Street, Boston.....	Price per pound.	.036 864.00		
N. E. Structural Co., 110 State Street, Boston.....	Price per pound.	.0325 780.00		Stipulates for payment for increased thickness of metal, not exceeding 1-16 inch, in case substitution of some sizes be necessary to meet deliveries required.

NOTE.—The contract was awarded to N. E. Structural Co.

APPENDIX U.

WASHINGTON STREET TUNNEL.—CANVASS OF BIDS FOR CUTTING OUT EASTERLY CONCRETE WALL, ETC., OF THE SUBWAY IN
HAYMARKET SQUARE AND REMOVING SUBWAY SIDE-WALL STEEL COLUMNS, CHANNELS, BRACES, ETC.—BIDS OPENED
NOVEMBER 10, 1908.

BIDDERS AND ADDRESSES.	Cutting out, removing and disposing of 85 cu. yds. of masonry.	Cutting out and leaving in the invert of the Subway 80 cu. yds. of masonry.	Cutting out and removing to the Canal street yard 18 tons of steel.	Totals.	TIME NAMED FOR COMPLETION, FROM DATE OF NOTICE TO BEGIN.
John E. Palmer, 1012 Old South Bldg., Boston.....	\$15.00 1,275.00	10.00 800.00	20.00 360.00	\$2,435.00	20 days.
Coleman Bros., 15 Court Square, Boston.....	10.00 850.00	8.00 640.00	10.00 180.00	1,670.00	30 days.
Coughlan & Sheils Co., 43 Tremont Street, Boston.....	9.75 828.75	8.25 660.00	8.00 144.00	1,632.75	28 days.
Hugh Nawn Contracting Co., 82 Savin Street, Roxbury.....	4.50 382.50	4.50 360.00	6.50 117.00	\$89.50	25 days.

NOTE.—The contract was awarded to Hugh Nawn Contracting Co.

APPENDIX V.

WASHINGTON STREET TUNNEL.—CANVASS OF BIDS FOR FILLING IN THE
PLEASANT STREET INCLINE OF THE TREMONT STREET SUBWAY.—
BIDS OPENED NOVEMBER 25, 1908.

BIDDERS AND ADDRESSES.	Lump sum for filling in the open in- cline with 2,000 cub. yds., more or less, of material already stored in and around the incline, and including the building of one brick manhole.	Number of men to be furnished.	
		Day.	Night.
Robert Eager 19 Wabeno St., Roxbury.....	1,800.00		
P. O'Riorden, 6 City Square, Charlestown.....	1,185.00	75	75
Hugh Nawn Contracting Co., 82 Savin St., Roxbury.....	994.00	As many as necessary to complete work on time	
Coleman Bros., 15 Court Square, Boston.....	900.00		
Coughlan & Sheils Co., 43 Tremont St., Boston.....	875.00	50	50

NOTE.—The contract was awarded to Coughlan & Sheils Co.

APPENDIX W.

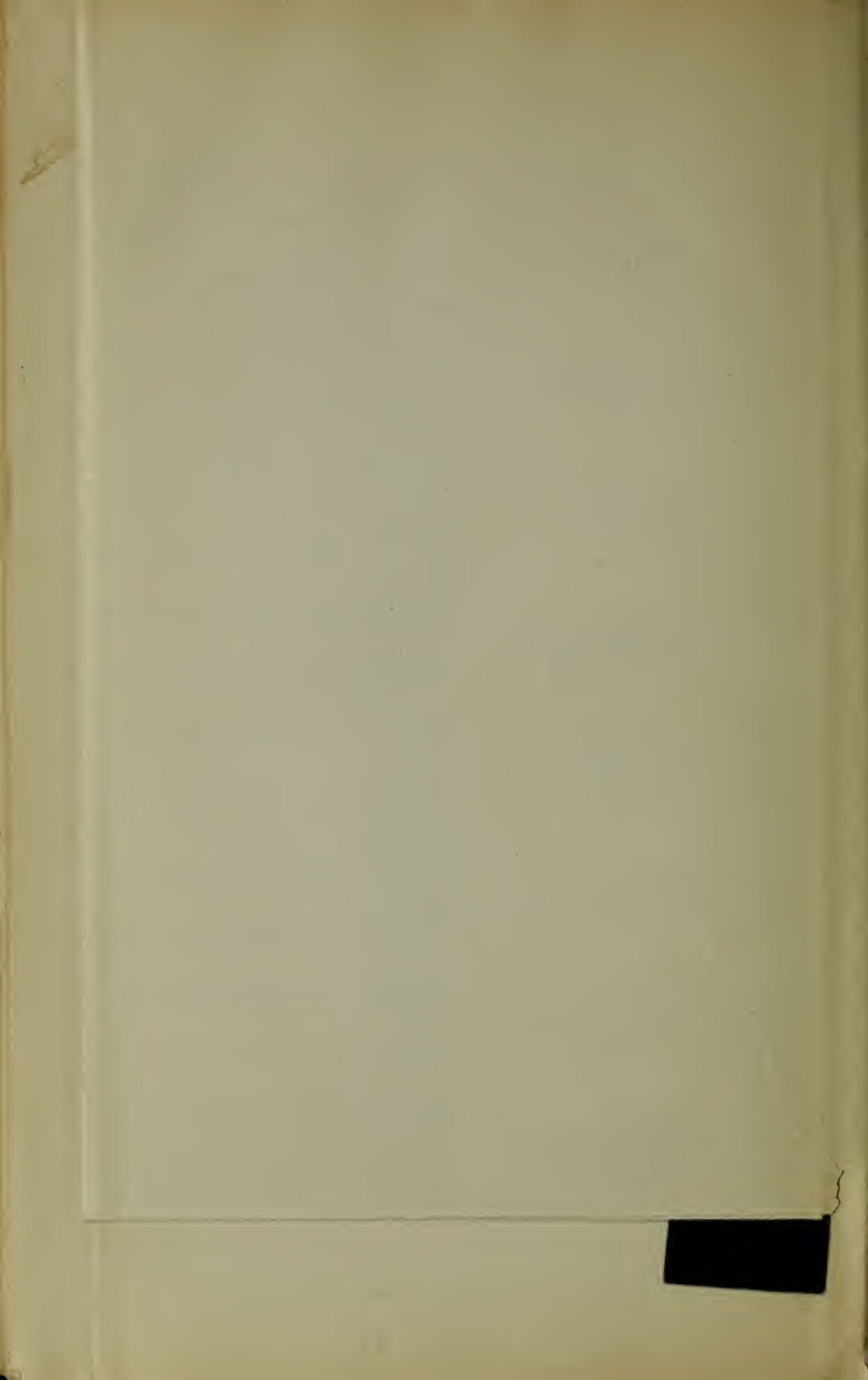
WASHINGTON STREET TUNNEL.—CANVASS OF BIDS FOR FURNISHING 80,000 POUNDS OF $\frac{1}{2}$ -INCH SQUARE TWISTED OPEN HEARTH STEEL REINFORCING RODS, DELIVERED AT THE CANAL STREET YARD, BOSTON.—BIDS OPENED DECEMBER 7, 1908.

BIDDERS AND ADDRESSES.	Price per Pound.	TOTALS, as bid; delivery other than at Canal Street Yard.	TOTALS, delivered at Canal Street Yard.	REMARKS.
Corrugated Bar Company, by E. A. Tucker, New England Agent, 683 Atlantic Avenue, Boston.....	CENTS 1.60	\$1,280.00	\$1,484.00	F. o. b. Pittsburg. Add \$.205 per 100 lbs. freight to Boston = \$164.00 + \$1.00 per ton haulage to Canal St. Yard, = \$40.00 = 1,280.00 + \$204.00.—20,000 lbs. in Boston Dec. 30, '08; " <i>Corrugated Bars</i> ," 1" round section, instead of as specified.
Ransome Concrete Machinery Co., 6 Beacon Street, Boston.....	1.755	.....	1,404.00	Order to be placed on or before Dec. 9, 1908.
Fred A. Houdlette & Son, Inc., 93 Broad Street, Boston.....	1.75	.....	1,400.00	Open Hearth Steel Rods, 32 ft. or 36 ft. lengths, preferably 32 ft. Entire delivery by Dec. 30, 1908, if ordered on or before Dec. 9.
The General Fireproofing Co., 161 Devonshire Street, Boston....	1.73	.....	1,384.00	Open Hearth Steel Rods, 32 ft. or 36 ft.—15 tons could be shipped from Youngstown, Ohio, immediately. A minimum car-load at Canal St. Yard Dec. 30, 1908.
Jones & Laughlin Steel Co., 131 State Street, Boston.....	1.68	1,344.00	1,384.00	F. o. b. cars Boston, to arrive Dec. 30, 1908. Add \$1.00 per ton haulage to Canal St. Yard, = \$1,344.00 + \$40.00. Terms, net cash 30 days.
H. P. Converse & Co., 88 Broad Street, Boston.....	1.72	.....	1,376.00	Open Hearth Steel Rods, 32 ft. or 36 ft.—20,000 lbs. on or before Dec. 30, 1908; balance two weeks later.
Portland Iron & Steel Co., Board of Trade Building, Boston..	1.70	.....	1,360.00	Open Hearth Steel Rods, 32 ft.—20,000 lbs. on or before Dec. 30, 1908; balance before Jan. 15, 1909.
Lackawanna Steel Co., 8 Oliver Street, Boston.....	1.70	.....	1,360.00	Open Hearth Steel Rods.—20,000 lbs. or more on or before Dec. 30, 1908.
Buell & Mitchell; 70 Kilby Street, Boston.....	1.70	.....	1,360.00	Open Hearth Steel Rods, 32 ft. or 36 ft. Entire delivery Dec. 30, 1908, if ordered on or before Dec. 8. Add .02 cent per lb. for less than car-loads.—Net cash 30 days.
The Concrete Steel Co., 29 Broadway, New York City....	1.65	1,320.00	1,360.00	For Open Hearth " <i>Haremeier</i> " Steel Bars, f. o. b. Boston. Add \$1.00 per ton haulage = \$1,320.00 + \$40.00. Entire delivery Dec. 30, 1908.
Wm. H. Perry Co., 47 Stillings Street, Boston.....	1.68	.....	1,344.00	Open Hearth Steel Rods, 32 ft. or 36 ft.—Entire Delivery Dec. 30, 1908.
Aberthaw Construction Co., 8 Beacon Street, Boston.....	1.68	.....	1,344.00	Open Hearth Steel Rods, 36 ft.—At least 20,000 lbs. by Dec. 30, 1908; balance 2 to 3 weeks later.
Dodge-Haley Co., 212 High Street, Boston.....	1.68	.....	1,344.00	Open Hearth Steel Rods, 32 ft.
Brown-Wales Co., 69 Purchase Street, Boston.....	1.675	.....	1,340.00	Open Hearth Steel Rods.—20,000 lbs. on or before Dec. 30, 1908; balance prior to Jan. 15, 1909.—Terms, net cash 30 days, or $\frac{1}{2}$ of 1% for cash within 10 days.
H. W. Hayes & Co., 101 Tremont Street, Boston.....	1.655	.....	1,324.00	Open Hearth Steel Rods, 32 ft. or 36 ft.—Entire delivery on or before Dec. 30, 1908.
Harrington, Robinson & Co., 272 Franklin Street, Boston.....	1.6425	.....	1,314.00	Open Hearth Steel Rods, 32 ft.—Entire delivery before Dec. 30, 1908, if ordered promptly.

NOTE.—The contract was awarded to Harrington, Robinson & Co.

CANVASS OF BIDS FOR FURNISHING AND DELIVERING PORTLAND CEMENT.—BIDS OPENED FEBRUARY 6, 1909.

BIDDERS AND ADDRESSES, AND BRANDS.		Prices per barrel for groups of minimum and maximum quantities, and latest dates on which orders for each group can be given under contract.					Maximum Rate of Delivery. Barrels per week.	Days' Notice required before shipment.	Sum allowed for each bag returned to storehouse. Cents.	Sum allowed for each bag returned, freight prepaid, to Mill. Cents.	Bid in force until	REMARKS.
		4,000 to 6,000 barrels.	6,000 to 12,000 barrels.	12,000 to 18,000 barrels.	18,000 to 24,000 barrels.	24,000 to 36,000 barrels.						
Curtis & Pope Lumber Co., 774 Albany St., Boston	Delivered on work from cars.	\$1.70 Dec. 30, 1909	\$1.68 Dec. 30, 1909	\$1.67 April 15, 1910	\$1.65 Oct. 15, 1910	\$1.65 Oct. 15, 1910	2,000	Seven	6½	7½	Feb. 23, 1909	
	ALPHA	Delivered on work from storehouse.	1.75 Dec. 30, 1909	1.73 Dec. 30, 1909	1.72 April 15, 1910	1.70 Oct. 15, 1910						
Coplay Cement Mfg. Co., 24 Milk St., Boston	Delivered on work from cars.	1.63 May 1, 1909	1.68 Sept. 1, 1909	1.73 Dec. 31, 1909	1.78 Oct. 15, 1910	1.70 Oct. 15, 1910	1,000	Seven	6½	..	Feb. 23, 1909	
	SAYLOR'S	Delivered on work from storehouse.	1.67 May 1, 1909	1.72 Sept. 1, 1909	1.77 Dec. 31, 1909	1.82 Oct. 15, 1910							1.74 Oct. 15, 1910
Windsor Cement Co., 161 Devonshire St., Boston	Delivered on work from cars.	1.67 Oct. 1, 1910	1.66 Oct. 1, 1910	1.65 Oct. 1, 1910	1.64 Oct. 1, 1910	1.64 Oct. 1, 1910	750	Fourteen	6½	7½	Feb. 25, 1909	
	VULCANITE	Delivered on work from storehouse.	1.74 Oct. 1, 1910	1.74 Oct. 1, 1910	1.73 Oct. 1, 1910	1.73 Oct. 1, 1910						
Eastern Clay Goods Co., 79 Milk St., Boston	Delivered on work from cars.	1.65 Oct. 10, 1910	1.65 Oct. 10, 1910	1.65 Oct. 10, 1910	1.65 Oct. 10, 1910	1.65 Oct. 10, 1910	1,500	Ten	6½	..	Feb. 23, 1909	
	EDISON	Delivered on work from storehouse.	1.70 Oct. 10, 1910	1.70 Oct. 10, 1910	1.70 Oct. 10, 1910	1.70 Oct. 10, 1910						
Waldo Brothers, 102 Milk St., Boston	Delivered on work from cars.	1.65 Oct. 15, 1910	1.65 Oct. 15, 1910	1.65 Oct. 15, 1910	1.65 Oct. 15, 1910	1.65 Oct. 15, 1910	2,000	Fourteen if from Mill	6½	7½	Feb. 13, 1909	Terms, 30 days; 1 cent per barrel discount for payment of bills in 10 days.
	ATLAS	Delivered on work from storehouse.	1.75 Oct. 15, 1910	1.75 Oct. 15, 1910	1.75 Oct. 15, 1910	1.75 Oct. 15, 1910						
Dolben & Sullivan, 161 Devonshire St., Boston	Delivered on work from cars.	1.65 Oct. 15, 1910	1.65 Oct. 15, 1910	1.65 Oct. 15, 1910	1.65 Oct. 15, 1910	1.65 Oct. 15, 1910	600	Twelve	6½	7½	March 1, 1909	
	PHOENIX	Delivered on work from storehouse.	— —	— —	— —	— —						
Wm. C. Norcross Co., 486 Albany St., Boston	Delivered on work from cars.	1.64 Oct. 15, 1910	1.64 Oct. 15, 1910	1.64 Oct. 15, 1910	1.64 Oct. 15, 1910	1.64 Oct. 15, 1910	2,000	Seven	6½	7½	March 1, 1909	
	WHITEHALL	Delivered on work from storehouse.	1.73 Oct. 15, 1910	1.73 Oct. 15, 1910	1.73 Oct. 15, 1910	1.73 Oct. 15, 1910						
Wm. C. Norcross Co., 486 Albany St., Boston	Delivered on work from cars.	1.64 Oct. 15, 1910	1.64 Oct. 15, 1910	1.64 Oct. 15, 1910	1.64 Oct. 15, 1910	1.64 Oct. 15, 1910	2,000	Seven	6½	7½	March 1, 1909	
	NORTHAMPTON	Delivered on work from storehouse.	1.73 Oct. 15, 1910	1.73 Oct. 15, 1910	1.73 Oct. 15, 1910	1.73 Oct. 15, 1910						
Windsor Cement Co., 161 Devonshire St., Boston	Delivered on work from cars.	1.64 Oct. 1, 1910	1.63 Oct. 1, 1910	— —	— —	— —	500	Fourteen	6½	7½	Feb. 25, 1909	
	CATSKILL	Delivered on work from storehouse.	1.71 Oct. 1, 1910	1.71 Oct. 1, 1910	— —	— —						
J. P. O'Connell Co., 192 Freeport St., Dorchester	Delivered on work from cars.	1.63 Oct. 15, 1910	1.63 Oct. 15, 1910	1.63 Oct. 15, 1910	1.63 Oct. 15, 1910	1.63 Oct. 15, 1910	3,000	Fourteen	6½	7½	Feb. 20, 1909	
	NAZARETH	Delivered on work from storehouse.	1.73 Oct. 15, 1910	1.73 Oct. 15, 1910	1.73 Oct. 15, 1910	1.73 Oct. 15, 1910						
Charles Warner Co., 161 Devonshire St., Boston	Delivered on work from cars.	1.63 Feb. 6, 1910	1.63 Feb. 6, 1910	1.63 Feb. 6, 1910	1.63 Feb. 6, 1910	1.63 Feb. 6, 1910	3,000	Fourteen	6½	7½	Feb. 20, 1909	
	NAZARETH	Delivered on work from storehouse.	1.69 Feb. 6, 1910	1.69 Feb. 6, 1910	1.69 Feb. 6, 1910	1.69 Feb. 6, 1910						
United Bldg. Material Co., 101 Milk St., Boston	Delivered on work from cars.	1.63 Oct. 15, 1910	1.63 Oct. 15, 1910	1.63 Oct. 15, 1910	1.63 Oct. 15, 1910	1.63 Oct. 15, 1910	—	Reasonable notice	6½	7½	Until revoked, at 10 days' notice	
	GIANT	Delivered on work from storehouse.	1.71 Oct. 15, 1910	1.71 Oct. 15, 1910	1.71 Oct. 15, 1910	1.71 Oct. 15, 1910						
James A. Davis & Co., 92 State St., Boston	Delivered on work from cars.	1.63 Dec. 31, 1910	1.63 Dec. 31, 1910	1.63 Dec. 31, 1910	1.63 Dec. 31, 1910	1.63 Dec. 31, 1910	—	Ten if from Mill	6½	7½	Until withdrawn	In car-loads and team-loads respectively.
	LEHIGH	Delivered on work from storehouse.	1.71 Dec. 31, 1910	1.71 Dec. 31, 1910	1.71 Dec. 31, 1910	1.71 Dec. 31, 1910						
David W. Lewis Co., 24 Milk St., Boston	Delivered on work from cars.	1.61 Jan. 1, 1910	1.61 Jan. 1, 1910	1.61 Oct. 15, 1910	1.61 Oct. 15, 1910	1.61 Oct. 15, 1910	1,000	Five	6½	7½	Feb. 25, 1909	
	HELDENBERG	Delivered on work from storehouse.	1.65 Jan. 1, 1910	1.65 Jan. 1, 1910	1.65 Oct. 15, 1910	1.65 Oct. 15, 1910							1.65 Oct. 15, 1910



APPENDIX Y.

EAST BOSTON TUNNEL.—CANVASS OF ALTERNATIVE BIDS FOR FURNISHING STEEL I-BEAMS FOR CONNECTION AT SCOLLAY SQUARE
BETWEEN THE EAST BOSTON TUNNEL AND THE SUBWAY.—BIDS OPENED FEBRUARY 11, 1909.

BIDDERS AND ADDRESSES.	Schedule II. 160,000 pounds of steel I-beams of the ordinary standard.		Schedule I. 140,000 pounds of wide-flanged steel I-beams, as described.	TIME NAMED FOR DELIVERY.
	Price per pound. Amount.	\$.01905 3,048.00		
Carnegie Steel Co., 125 Milk St., Boston	Price per pound. Amount.	.01905 3,048.00	..... .....	Ship from Mill, Feb. 16, 1909.
Cambria Steel Co., 101 Tremont St., Boston	Price per pound. Amount.	.019 3,040.00	..... .....	Next week, if ordered at once.
The Phoenix Iron Co., 110 State St., Boston	Price per pound. Amount.	..... .....	.01935 2,709.00	3 weeks.
Bethlehem Steel Co., 165 High St., Boston	Price per pound. Amount.	..... .....		6 weeks.

NOTE.—The contract was awarded to Bethlehem Steel Co.

APPENDIX Z.

CANVASS OF BIDS FOR FURNISHING 120,000 POUNDS OF $\frac{1}{2}$ -INCH SQUARE TWISTED OPEN HEARTH STEEL REINFORCING RODS, DELIVERED AT THE CANAL STREET YARD, BOSTON,—BIDS OPENED FEBRUARY 11, 1909.

BIDDERS AND ADDRESSES.	Price per 100 Pounds	TOTALS, delivered at Canal Street Yard.	REMARKS.
Corrugated Bar Company, by E. A. Tucker, New England Agent, 683 Atlantic Avenue, Boston.....	\$1 81	\$2,172.00	1-inch round corrugated open-hearth steel bars. Shipment by March 1, 1909. This price for car-loads.
Aberthaw Construction Co., 8 Beacon Street, Boston.	1 78	2,136.00	Delivery in one month.
Arthur C. Harvey Co., 374 Congress Street, Boston.....	1 77	2,124.00	Delivery in one to two weeks. For Bessemer steel rods, \$1.66 per 100 pounds.
Hudson Structural Steel Co., Inc., 79 Milk Street, Boston.....	1 745	2,094.00	One-half in four weeks; remainder two weeks later.
Portland Iron & Steel Co., Board of Trade Building, Boston....	1 72	2,064.00	Delivery in 30 days.
Brown-Wales Co., 69 Purchase Street, Boston....	1 72	2,064.00	Delivery in three to four weeks.
Ransome Concrete Machinery Co., 6 Beacon Street, Boston.....	1 715	2,058.00	
The General Fireproofing Co., 161 Devonshire Street, Boston.....	1 71	2,052.00	Delivery in 30 days.
Laekawanna Steel Co., 8 Oliver Street, Boston....	1 705	2,046.00	Delivery on March 15, 1909.
Cambria Steel Co., 101 Tremont Street, Boston.....	1 705	2,046.00	Ship in 30 days; possibly three weeks.
Dodge-Haley Co., 212 High Street, Boston.....	1 705	2,046.00	Delivery in 30 days.
Jones & Laughlin Steel Co., 131 State Street, Boston.....	1 705	2,046.00	Delivery on March 15, 1909.
Harrington, Robinson & Co., 272 Franklin Street, Boston.....	1 70	2,040.00	Delivery by March 10, 1909.
Fred A. Houdlette & Son, Inc., 93 Broad Street, Boston.....	1 685	2,022.00	Delivery on March 15, 1909.
H. P. Converse & Co., 88 Broad Street, Boston.	1 68	2,016.00	
Wm. H. Perry Co., 47 Stillings Street, Boston.....	1 66	1,992.00	Delivery on March 18, 1909.—First car-load could leave mill about 7 to 10 days from date of receipt of order at mill; remainder to follow immediately. Last car-load could be held 30 to 60 days if desired.
Corrugated Bar Company, by E. A. Tucker, New England Agent, 683 Atlantic Avenue, Boston.....	1 56	1,872.00	Hot twisted steel bars, not conforming to specifications.

NOTE:—The contract was awarded to Wm. H. Perry Co.

APPENDIX AA.

CAMBRIDGE CONNECTION.—CANVASS OF BIDS FOR FURNISHING STEEL AND IRON
WORK FOR SECTION 1, TUNNEL UNDER BEACON HILL.—BIDS OPENED
MARCH 18, 1909.

BIDDERS AND ADDRESSES.		31,000 pounds structural steel.	TIME NAMED FOR DELIVERY.
N. E. Structural Co., 110 State St., Boston.....	Price per pound. Amount.	3 cents. \$930.00	May 1, 1909.
H. P. Converse & Co., 88 Broad St., Boston.....	Price per pound. Amount.	2½ cents. \$775.00	May 1, 1909.
Chelmsford Foundry Co., Medford.....	Price per pound. Amount.	2½ cents. \$775.00	Beams, April 15, 1909, Balance, May 1, 1909.
Phoenix Iron Co., 110 State St., Boston.....	Price per pound. Amount.	2½ ¹⁵ / ₁₀₀ cents. \$759.50	May 1, 1909.

NOTE.—The contract was awarded to Phoenix Iron Co.

APPENDIX BB.

WASHINGTON STREET TUNNEL.—CANVASS OF BIDS FOR FURNISHING AND SETTING IN PLACE SOFT STEEL FENCE BETWEEN TRACKS
AT HAYMARKET SQUARE STATION.—Bids OPENED MARCH 25, 1909.

BIDDERS AND ADDRESSES.	Lump Price.	Remarks.
A. B. Robbins Iron Co., Norfolk Downs, Quincy	\$1,443.00	.....
The Morss & Whyte Co., 75 Cornhill, Boston	975.00	.....
L. M. Ham & Co., 150 Portland St., Boston	880.00	If six lags with lead sleeves be substituted for the ten expansion bolts in each section, deduct \$140.00.
The Natl. Manufacturing Co., 24 Milk St., Boston	650.00	.....
Shawmut Iron & Wire Works, 76 Beverly St., Boston	640.00	.....

NOTE.—The contract was awarded to Shawmut Iron & Wire Works.

APPENDIX CC.

CAMBRIDGE CONNECTION.—CANVASS OF BIDS FOR CONSTRUCTION OF SECTION 1, 2,000 LINEAR FEET OF TUNNEL UNDER BEACON HILL.—BIDS OPENED MARCH 30, 1909.

"A."—ALL WORK ASSUMED TO BE DONE IN FREE AIR.

BIDDERS AND ADDRESSES.	58,000 c. yds. earth excavation.	Removing and disposing of 120 c. yds. masonry, cellar floors, etc.	Furnishing, hauling and putting in place 19,000 c. yds. Portland concrete. (See page 41 of Specifications.)	Furnishing and laying 20 c. yds. Portland cement brickwork.	Laying 300 lin. ft. 6-inch to 12-inch vitrified pipe, furnished by the Commission.	Laying 100 lin. ft. 16-inch to 24-inch vitrified pipe, furnished by the Commission.	Setting in place and securing 250 tons of reinforcing rods, etc., weighing less than 6 pounds per lin. ft.	Setting in place and securing 70 tons of steel and iron weighing 6 pounds or more per lin. ft.	Furnishing, preparing and applying to joints, etc., 15,000 sq. yds. of coating, or skin, of Portland cement mortar, 1-inch thick.	Furnishing, preparing and applying 50 sq. yds. of water proof coating, 1-inch thick, of pitch.	Preparing and applying 10,000 sq. yds. of tarred felt, pitch, etc., in layers.	Supporting, etc., including work and risks not covered by other items; north-west of Sta. 3 + 85.	Supporting, etc., as item (k), covering the length of 1715 feet south-east of Sta. 3 + 85.	TOTALS.
	a	b	c. 2, 4f	d	e	ee	f	ff	g	h	i	k	kk	
Peter W. Hill, 426 Old South Bldg., Boston.....	\$7.00 406,000.00	\$10.00 1,200.00	\$16.00 304,000.00	\$20.00 400.00	\$.50 150.00	\$1.00 100.00	\$15.00 3,750.00	\$25.00 1,750.00	\$.50 7,500.00	\$.50 25.00	\$.75 7,500.00	— 7,000.00	\$6.00 10,290.00	\$749,665.00
Joseph McCabe, 505 Banigan Bldg., Providence, R. I.	5.50 319,000.00	8.00 960.00	13.25 251,750.00	20.00 400.00	.80 240.00	1.00 100.00	19.50 4,875.00	28.00 1,960.00	.60 9,000.00	1.20 60.00	.50 5,000.00	— 3,190.00	8.25 14,148.75	610,683.75
Coughlan & Sheils Co., 43 Tremont St., Boston.....	5.75 333,500.00	8.00 960.00	12.00 228,000.00	20.00 400.00	2.00 600.00	2.00 200.00	10.00 2,500.00	20.00 1,400.00	.40 6,000.00	.50 25.00	.30 3,000.00	— 10,000.00	11.00 18,865.00	605,450.00
Manufacturers Contracting Co., Wilmington, Del.....	5.98 346,840.00	3.00 360.00	11.90 226,100.00	18.00 360.00	.40 120.00	1.25 125.00	10.00 2,500.00	10.00 700.00	.40 6,000.00	.50 25.00	.20 2,000.00	— 3,500.00	2.00 3,430.00	592,060.00
Jones & Meehan, 10 Tremont St., Boston.....	5.00 290,000.00	6.00 720.00	12.00 228,000.00	18.00 360.00	1.00 300.00	2.00 200.00	15.00 3,750.00	20.00 1,400.00	.50 7,500.00	.50 25.00	.30 3,000.00	— 4,000.00	4.00 6,860.00	546,115.00
Northeastern Construction Co., 6 Beacon St., Boston.....	4.50 261,000.00	5.00 600.00	12.50 237,500.00	18.00 360.00	.50 150.00	1.00 100.00	10.00 2,500.00	12.00 840.00	.50 7,500.00	1.00 50.00	.20 2,000.00	— 10,000.00	6.00 10,290.00	532,890.00
Bruno & Petitti, 18 Tremont St., Boston.....	4.75 275,500.00	5.00 600.00	11.00 209,000.00	20.00 400.00	2.00 600.00	3.00 300.00	25.00 6,250.00	25.00 1,750.00	.50 7,500.00	1.00 50.00	.40 4,000.00	— 10,000.00	— 15,000.00	530,950.00
Wm. H. Smith Co., 445 Tremont Bldg., Boston.....	4.90 284,200.00	5.00 600.00	9.90 188,100.00	20.00 400.00	2.00 600.00	6.00 600.00	25.00 6,250.00	25.00 1,750.00	.75 11,250.00	1.00 50.00	.25 2,500.00	— 25,000.00	2.00 3,430.00	524,730.00
Coleman Bros., 15 Court Sq., Boston.....	4.50 261,000.00	6.00 720.00	12.00 228,000.00	25.00 500.00	1.00 300.00	2.00 200.00	15.00 3,750.00	20.00 1,400.00	.50 7,500.00	1.00 50.00	.75 7,500.00	— 5,000.00	2.50 4,287.50	520,207.50
Metropolitan Contracting Co., 95 Milk St., Boston.....	4.75 275,500.00	5.00 600.00	10.00 190,000.00	20.00 400.00	1.00 300.00	1.50 150.00	20.00 5,000.00	20.00 1,400.00	.50 7,500.00	.50 25.00	.35 3,500.00	— 3,500.00	.50 \$57.50	488,732.50
United Engineering & Contracting Co., 32 E. 32nd St., New York City.....	3.80 220,400.00	4.00 480.00	12.00 228,000.00	20.00 400.00	1.00 300.00	1.00 100.00	10.00 2,500.00	15.00 1,050.00	.75 11,250.00	.60 30.00	.20 2,000.00	— 5,000.00	6.00 10,290.00	481,800.00
Patrick McGovern, 6 Beacon St., Boston.....	4.55 263,900.00	4.00 480.00	10.00 190,000.00	18.00 360.00	.50 150.00	1.00 100.00	10.00 2,500.00	14.00 980.00	.25 3,750.00	.40 20.00	.25 2,500.00	— 3,500.00	.50 \$57.50	469,097.50

(See No. 9381 for FREE and COMPRESSED AIR.)

APPENDIX DD.

CAMBRIDGE CONNECTION.—CANVASS OF BIDS FOR CONSTRUCTION OF SECTION 1, 2,000 LINEAR FEET OF TUNNEL UNDER BEACON HILL.—BIDS OPENED MARCH 30, 1909.

"B."—300 LINEAR FEET ASSUMED TO BE BUILT UNDER COMPRESSED AIR; THE REMAINDER IN FREE AIR.

NOTE—Compressed Air Items are shown by (C. A.)

BIDDERS AND ADDRESSES.	49,300 c. yds. earth excavation.	8,700 c. yds. earth excavation. (C. A.)	Removing and disposing of 120 c. yds. masonry, cellar floors, etc.	Furnishing, hauling and putting in place 16,200 c. yds. Port- land concrete. (See page 41 of Specifica- tions.)	Furnishing, hauling and putting in place 2,800 c. yds. Port- land concrete. (C. A.)	Furnishing and laying 23 c. yds. Portland cement brick- work.	Laying 300 lin. ft. 6-inch to 12-inch vitrified pipe, furnished by the Commis- sion.	Laying 100 lin. ft. 16 inch to 24-inch vitrified pipe, furnished by the Commis- sion.	Setting in place and securing 240 tons of rein- forcing rods, etc., weighing less than 6 pounds per lin. ft.	Setting in place and securing 10 tons of rein- forcing rods, etc., weighing less than 6 pounds per lin. ft. (C. A.)	Setting in place and securing 70 tons of steel and iron weighing 6 pounds or more per linear foot.	Furnishing, preparing and applying to joints, etc., 12,800 sq. yds. of coating, or skin, of Port- land cement mortar, $\frac{1}{2}$ " thick.	Furnishing, preparing and applying to joints, etc., 2,200 sq. yds. of coating, or skin, of Port- land cement mortar, $\frac{1}{2}$ " thick (C. A.)	Furnishing, preparing and applying 50 sq. yds. of waterproof coating, $\frac{1}{4}$ -inch thick, of pitch.	Preparing and applying 8,500 sq. yds. of tarred felt, pitch, etc., in layers.	Preparing and applying 1,500 sq. yds. of tarred felt, pitch, etc., in layers. (C. A.)	Supporting, etc., including work and risks not covered by other items; north-west of Sta. 3+85.	Supporting, etc., as Item (k), covering a length of 1415 feet south-east of Sta. 3+85.	Supporting, etc., as Item (k), covering a length of 300 feet south- east of Sta. 3+85. (C. A.)	Installing compressed air plant, in- cluding fur- nishing plant in addition to that ob- tained from the Commis- sion. (C. A.)	TOTALS.
	(a)	(a) c	(b)	(c. 2.4) r	(c. 2.4) re	(d)	(e)	(ee)	(f)	(f) c	(ff)	(g)	(g) c	(h)	(l)	(l) c	(k)	(kk)	(kk) c		
Peter W. Hill, 426 Old South Bldg., Boston.....	\$7.00 345,100.00	\$8.50 73,950.00	\$10.00 1,200.00	\$16.00 259,200.00	\$20.00 56,000.00	\$20.00 400.00	\$.50 150.00	\$1.00 100.00	\$15.00 3,600.00	\$20.00 200.00	\$25.00 1,750.00	\$.50 6,400.00	\$.75 1,650.00	\$.50 25.00	\$.75 6,375.00	\$1.25 1,875.00	..... 7,000.00	\$6.00 8,490.00	\$6.00 1,800.00	..... 2,000.00	\$777,265.00
Joseph McCabe, 505 Banigan Bldg., Providence, R. I.	5.50 271,150.00	9.50 83,125.00	8.00 960.00	13.25 214,650.00	21.00 58,800.00	20.00 400.00	.80 240.00	1.00 100.00	19.50 4,680.00	27.00 270.00	28.00 1,960.00	.60 7,680.00	.60 1,320.00	1.20 60.00	.50 4,250.00	.75 1,125.00	..... 3,190.00	8.25 11,673.75	\$.25 2,475.00	..... 16,000.00	683,633.75
Manufacturers Contracting Co., Wilmington, Del.....	5.98 294,814.00	7.98 69,426.00	3.00 360.00	11.90 192,780.00	13.50 37,800.00	18.00 360.00	.40 120.00	1.25 125.00	10.00 2,400.00	15.00 150.00	10.00 700.00	.40 5,120.00	.50 110.00	.50 25.00	.20 1,700.00	.40 600.00	..... 3,500.00	2.00 2,830.00	2.00 600.00	..... 25,000.00	639,510.00
Coughlan & Sheils Co., 43 Tremont St., Boston.....	5.75 283,475.00	6.25 54,375.00	8.00 960.00	12.00 194,400.00	13.00 36,400.00	20.00 400.00	2.00 600.00	2.00 200.00	10.00 2,400.00	12.00 120.00	20.00 1,400.00	.40 5,120.00	.40 880.00	.50 25.00	.30 2,550.00	.40 600.00	..... 10,000.00	11.00 15,565.00	11.00 3,300.00	..... 10,000.00	622,770.00
Jones & Meehan, 10 Tremont St., Boston.....	5.00 246,500.00	5.00 43,500.00	6.00 720.00	12.00 194,400.00	14.00 39,200.00	18.00 360.00	1.00 300.00	2.00 200.00	15.00 3,600.00	30.00 300.00	20.00 1,400.00	.50 6,400.00	.60 1,320.00	.50 25.00	.30 2,550.00	.40 600.00	..... 4,000.00	4.00 5,660.00	4.00 1,200.00	..... 18,000.00	570,235.00
Bruno & Petitti, 18 Tremont St., Boston.....	4.75 234,175.00	5.25 45,675.00	5.00 600.00	11.00 178,200.00	12.00 33,600.00	20.00 400.00	2.00 600.00	3.00 300.00	25.00 6,000.00	25.00 250.00	25.00 1,750.00	.50 6,400.00	.50 1,100.00	1.00 50.00	.40 3,400.00	.40 600.00	..... 10,000.00	..... 12,376.00	5.00 1,500.00	..... 25,000.00	561,976.00
Wm. H. Smith Co., 445 Tremont Bldg., Boston.....	4.90 241,570.00	7.00 60,900.00	5.00 600.00	9.90 160,380.00	12.00 33,600.00	20.00 400.00	2.00 600.00	6.00 600.00	25.00 6,000.00	25.00 250.00	25.00 1,750.00	.75 9,600.00	.90 1,980.00	1.00 50.00	.25 2,125.00	.35 525.00	..... 25,000.00	2.00 2,830.00	2.50 750.00	..... 1,500.00	551,010.00
Northeastern Construction Co., 6 Beacon St., Boston.....	4.50 221,550.00	5.00 43,500.00	5.00 600.00	12.50 202,500.00	13.00 36,400.00	18.00 360.00	.50 150.00	1.00 100.00	10.00 2,400.00	11.00 110.00	12.00 840.00	.50 6,400.00	.50 1,100.00	1.00 50.00	.20 1,700.00	.30 450.00	..... 10,000.00	6.00 8,499.00	6.00 1,800.00	..... 8,000.00	546,800.00
Coleman Bros., 15 Court Sq., Boston.....	4.50 221,550.00	5.00 43,500.00	6.00 720.00	12.00 194,400.00	13.00 36,400.00	25.00 500.00	1.00 300.00	2.00 200.00	15.00 3,600.00	20.00 200.00	20.00 1,400.00	.50 6,400.00	.75 1,650.00	1.00 50.00	.75 6,375.00	1.00 1,500.00	..... 5,000.00	2.50 3,537.50	2.50 750.00	..... 10,000.00	538,332.50
United Engineering & Contracting Co., 32 E. 32nd St., New York City.....	3.80 187,340.00	5.00 43,500.00	4.00 480.00	12.00 194,400.00	15.00 42,000.00	20.00 400.00	1.00 300.00	1.00 100.00	10.00 2,400.00	10.00 100.00	15.00 1,050.00	.75 9,600.00	.75 1,650.00	.60 30.00	.20 1,700.00	.25 375.00	..... 5,000.00	6.00 8,490.00	6.00 1,800.00	..... 15,000.00	515,715.00
Metropolitan Contracting Co., 95 Milk St., Boston.....	4.75 234,175.00	5.25 45,675.00	5.00 600.00	10.00 162,000.00	10.50 29,400.00	20.00 400.00	1.00 300.00	1.50 150.00	20.00 4,800.00	25.00 250.00	20.00 1,400.00	.50 6,400.00	.60 1,320.00	.50 25.00	.35 2,975.00	.35 525.00	..... 3,500.00	.50 707.50	.50 150.00	..... 5,000.00	499,752.50
Patrick McGovern, 6 Beacon St., Boston.....	4.55 224,315.00	5.00 43,500.00	4.00 480.00	10.00 162,000.00	11.50 32,200.00	18.00 360.00	.50 150.00	1.00 100.00	10.00 2,400.00	11.50 115.00	14.00 980.00	.25 3,200.00	.30 660.00	.40 20.00	.25 2,125.00	.30 450.00	..... 3,500.00	.50 707.50	1.00 300.00	..... 6,000.00	483,562.50

(See No. 9380 FOR FREE AIR ONLY.)

APPENDIX EE.

CAMBRIDGE CONNECTION. — CANVASS OF BIDS FOR FURNISHING AND DELIVERING ADDITIONAL STEEL AND IRON WORK FOR SECTION 1, TUNNEL UNDER BEACON HILL.—BIDS OPENED APRIL 1, 1909.

BIDDERS AND ADDRESSES.	42,500 lbs. steel tie-rods, incl. nuts. (cents per lb.)	2,340 lbs. steel turn-buckles. (cents per lb.)	6,200 lbs. cast iron. (cents per lb.)	TOTALS.
H. P. Converse & Co., 88 Broad St., Boston.....	2.23 \$947.75	8.0 \$187.20	1.6 \$99.20	\$1,234.15
Wm. H. Perry Co., 47 Stillings St., Boston....	2.1 \$92.50	7.0 163.80	2.1 130.20	1,186.50
Harrington, Robinson & Co., 272 Franklin St., Boston.....	2.36 1,003.00	2.36 55.22	1.75 108.50	1,166.72
L. F. Shoemaker & Co., Harrison Bldg., Philadelphia.....	1.98 \$41.50	6.0 140.40	1.98 122.76	1,104.66
Fred A. Houdlette & Son, Inc., 93 Broad St., Boston.....	2.2 935.00	2.2 51.48	1.8 111.60	1,098.08

APPENDIX FF.

CANVASS OF BIDS FOR FURNISHING 340,000 POUNDS OF $\frac{7}{8}$ -INCH SQUARE TWISTED OPEN HEARTH STEEL REINFORCING RODS, DELIVERED AT THE CANAL STREET YARD, BOSTON.—BIDS OPENED APRIL 1, 1909.

BIDDERS AND ADDRESSES.	Price per 100 Pounds.	TOTALS, delivered at Canal Street Yard.	REMARKS.
Ransome Concrete Machinery Co., 6 Beacon St., Boston.....	\$1.53	\$5,202.00	Delivery in 3 weeks.
Portland Iron & Steel Co., Board of Trade Bldg., Boston.....	1.51	5,134.00	Half in 2 weeks; balance in 4 weeks.
W. E. Clark & Co., 120 Milk St., Boston.....	1.51	5,134.00	Delivery as required.
Hudson Structural Steel Co., Inc., 79 Milk St., Boston..	1.50	5,100.00	Six weeks.
Wm. H. Perry Co., 47 Stillings St., Boston.....	1.50	5,100.00	Six weeks.
Lackawanna Steel Co., 8 Oliver St., Boston.....	1.48	5,032.00	Complete in 45 days.
Harrington, Robinson & Co., 272 Franklin St., Boston.....	1.47	4,998.00	Begin delivery in 3 weeks; complete 3 weeks later.
Cambria Steel Co., 101 Tremont St., Boston.....	1.455	4,947.00	Begin in 7-10 days; complete at 20 tons per day.
Jones & Laughlin Steel Co., 131 State St., Boston.....	1.445	4,913.00	Begin in 3 weeks; complete in 5 weeks.
Buell & Mitchell, 120 Liberty St., New York City...	1.445	4,913.00	Can ship car-loads April. May or June.
Fred A. Houdlette & Son, Inc., 93 Broad St., Boston.....	1.44	4,896.00	Shipment in 3 weeks. "Havemeyer Deformed Steel Bars."
Corrugated Bar Company, by E. A. Tucker, New England Agent, 683 Atlantic Ave., Boston.....	1.438	4,889.20	For corrugated bars, 1" round or $\frac{7}{8}$ " square.—Ship in 10-14 days.
A. Milne & Co., 8 Oliver St., Boston.....	1.435	4,879.00	Begin in 2 weeks; complete in 40 days.
Eastern Expanded Metal Co., 101 Tremont St., Boston.....	1.41	4,794.00	First car-load in 15 days; balance in 20 days.

NOTE.—The contract was awarded to Eastern Expanded Metal Co.

APPENDIX GG.

CAMBRIDGE CONNECTION.—CANVASS OF BIDS FOR ADDITIONAL STEELWORK, BEACON HILL TUNNEL, AS PER LETTER OF APRIL 8, 1909.

BIDDERS AND ADDRESSES.	Steel Rods, Nuts, etc.	Steel Turnbuckles.	Clevis Nuts, Pins, etc.	Cast-iron Washers.	TOTALS.	TIME NAMED FOR DELIVERY.
Lewis F. Shoemaker & Co., Harrison Bldg., Philadelphia.	34,000 lbs. @ 24c. \$816.00	78 @ \$2.25 each 175.50	78 @ \$6.50 each 507.00	200 lbs. @ 1.98c. 122.76	\$1,621.26	3 to 4 weeks.
Fred A. Houdlette & Son, Inc., 93 Broad St., Boston.....	34,000 lbs. @ 3.25c. 1,105.00	2,340 lbs. @ 3.25c. 76.05	3,600 lbs. @ 3.25c. 117.00	6200 lbs. @ 1.70c. 105.40	1,403.45	"Very promptly."

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